E-posters abstract book

SLEEP MEDECINE

SM-DA-01

2-years follow-up (FU) results of ORCADES study: long-term mandibular repositioning device (MRD) therapy in patients treated for Obstructive Sleep Apnea (OSA)

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OBJECTIVES:

ORCADES, a national prospective multicenter cohort study is evaluating the long-term benefits of a custom-made MRD in OSA patients noncompliant with Continuous Positive Airway Pressure (CPAP).

METHODS:

315 OSA patients fitted with a custom-made titratable CAD/CAM MRD (ResMed, Narval CC™) are evaluated over 5 years for evolution of respiratory and sleep data, OSA symptoms, quality of life and side effects. Interim results with PG/PSG control and orodental assessment at 2-year follow-up (FU) are presented here.

RESULTS:

237 of patients (75%) treated with MRD were kept in the study at 2-year FU. Among the 25% study discontinuation: 16% stopped prematurely MRD therapy for either side effect (9%) or lack of efficacy (7%), and 9% study consent withdrawal or lost to FU or returned to CPAP therapy. Globally, mean AHI was reduced under MRD therapy from 29±15 /h at baseline to 12±12 /h (-16±12 /h) at 2-year FU. AHI was reduced by at least 50% in 67% of patients regardless baseline OSA severity (mild, moderate and severe). An AHI<10 was got in 77%, 67% and 37% of mild, moderate and severe OSA patients, respectively. Epworth score was reduced from 11±5 to 7±4. In severe OSA, 53% of patients got an AHI<15. MRD compliance was maintained over time at a high level (6.3 h/night, 6.6 nights/week) with 97% of patients who wished to continue MRD therapy. Independent predictor of MRD continuation at 2 years was a high benefit-risk ratio confirmed by sleep physician at 3-month FU (OR=3.7). Majority of side effects were minor with 10% of patients presenting mild dental mobility. There was very little additional therapy discontinuation and new side effects compared to those described previously at 3-month FU.

CONCLUSION:

Long-term effectiveness of the custom-made Narval CC MRD was preserved satisfactorily in mild-to-severe OSA patients noncompliant with CPAP regardless of initial OSA severity with good tolerability and few significant side effects. A regular follow-up at once by sleep physicians and dental sleep specialists is necessary to control both the objective efficiency of MRD and the oral status in order to adjust or adapt if necessary therapy.

SM-DA-02

Efficacy and mechanism of mandibular advancement devices for persistent sleep apnea after surgery: a prospective study

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Purpose of the study: To explore the feasibility, the efficacy, and the mechanism of mandibular advancement devices (MAD) in the treatment of persistent sleep apnea after surgery.

Materials and methods used: Nineteen patients who failed uvulopalatopharyngoplasty (UPPP) or UPPP plus genioglossus advancement and hyoid myotomy (GAHM) were given a non-adjustable MAD for treatment. All patients had polysomnography (PSG) at least 6 months post-UPPP with and without the MAD. Seventeen patients had computed tomography (CT) examinations.

Results: After the application of MAD, the apnea hypopnea index (AHI) decreased significantly from 41.2 ± 13.1/h to 10.1 ± 5.6/h in the responder group. The response rate was 57.9 % (11/19). During sleep apnea/hypopnea acquired from sedated sleep, the cross-sectional area and anterior-posterior and lateral diameters of the velopharynx enlarged significantly from 4.2 ± 6.0 mm2 to 17.5 ± 15.3 mm2, 1.9 ± 2.3 mm to 6.5 ± 4.1 mm, and 1.1 ± 1.3 mm to 2.6 ± 2.1 mm, respectively ($P < 0.01$) in the responder group with MAD. The velopharyngeal collapsibility also decreased significantly from 83.3 ± 21.8 % to 46.5 ± 27.1 %. The glossopharyngeal collapsibility decreased from 39.8 ± 39.1 % to −22.9 ± 73.2 % ($P < 0.05$).

Conclusion: MAD can be an effective alternative treatment for patients with moderate and severe OSAHS after surgery. The principal mechanisms underlying the effect of MAD are expansion of the lateral diameter of the velopharynx, the enlargement of the velopharyngeal area, the reduction of velopharyngeal and glossopharyngeal collapsibility, and the stabilization of the upper airway.

SM-DA-03

Long-term tooth displacement in Obstructive Sleep Apnea Syndrome (OSAS) patient treated with custom-made Mandibular Repositioning Device (MRD): Long-term results of ORCADES study.

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OBJECTIVES:

ORCADES is a French prospective cohort study that aims to evaluate long-term custom-made MRD benefits in OSAS patients after CPAP failure or refusal. Tooth displacements were analyzed in a patient subgroup through a numerical 3D methodology.

MATERIAL AND METHODS:

44 OSAS patients treated with a custom-made MRD (ResMed, Narval CC™) whom got a MRD replacement between 1 to 4 year of Follow-up (FU) and an optical scanner of their dental cast at initiation (t0) and FU (t1) were analyzed thanks to 3D triangulation software. Each tooth surface mesh is defined in order to calculate each tooth barycenter at t0 and t1. Molar and premolar barycenters are chosen as references in order to superpose 3D models thanks to an iterative closest point (ICP) algorithm. Each tooth translation, rotation, between t0 and t1 are then calculated by ICP methodology.

RESULTS:

Population: mean Age: 54±11.7 y, BMI: 27±3 kg/m², 38 men (86.3%), 64.3% dental class I, 30% dental class II. Mean FU: 31±8 months. Mean mandibular advancement with MRD: 8,3±2,2 mm. Overjet and overbite variation at FU were respectively -0.08±0.51 (med [Q1;Q3]: -0.06[-0.40;0.28]) mm and 0.43±0.55 (med [Q1; Q3]: 0.50[0.02;0.75]) ; min: -0.91, max: 1.6 mm.

6 patients (13.6%) had an overjet increase between 1.0 to 1.6 mm and two patients (3%) had an overbite decrease between 1.2 and 1.6 mm. For two of them, a side effect for tooth mobility/migration had been declared by investigators. For the four other patients, investigators didn't report any significant side effect. Mean canines and incisors displacements ranged from 0.32±0.17 and 0.55±0.24 mm at mandibular and maxillary level. There was no significant correlation between tooth displacement and FU duration or mandibular advancement level.

CONCLUSION:

Tooth displacements were not significant for most of the patients after 30 months of FU. Mandibular advancement and duration of MRD therapy didn't seem to have an impact on tooth displacement. Benefit risk ratio stays largely positive to continue MRD therapy despite these low displacements.

SM-DA-04

Mandibular Advancement Devices: A Review of 554 Cases (2007-2015)

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BACKGROUND

Oral Appliances Principle

A mandibular advancement device (MAD) is a unit of orthodontic origin (enhancer class II) for maintaining the mandible in propulsion, which allows to liberate the basic retro-lingual space and restore, during sleep, normal ventilation of the upper airways.

The purpose of this presentation consists in trying, from our experience of over 550 MAO and analysis of different types of MAD, to answer the question: what oral appliance for which patient?

MATERIALS AND METHODS

Single-Center Study with	**141 RESMED MADs**
	200 TALI («bielette de Herbt») MADs
	185 SOMNOMED MADs
	28 INDUSTRIELLE MADs
Inclusion Criteria	**AHI between 15 and 30, in the absence of heart problems**
	AHI above 30, in case of CPAP refusal or CPAP intolerance
	Maximum active propulsion of at least 6 mm
Exclusion Criteria	**Poor dental status**
	Doubt on temporomandibular joints
	Small mouth opening

Technical Analysis of Different Oral Appliances

Common Criteria for All Types of Devices: Two gutters with a propulsion system. These are the defining elements following the High Authority of Health in France.

Mode of Action: There are two types of action – propulsion and retention.

Propulsion: The lower jaw is moved by rods forward and down.

Retention: The lower jaw is moved forward and up.

Specificity of Gutters in Each Type of Oral Appliances

Gutters are made of rigid or flexible material, the gutter encompassing all the teeth or not, manufacturing method of the gutter is artisanal or CAD/CAM (computer-aided design and computer-aided manufacturing).

RESULTS

Complications and Side Effects observed in each of these oral appliances.

Dental movement 10 cases

Temporomandibular joints disorder 14 cases

Uncontrollable mouth opening in patients with long face 5cases

Painful dental clasping sensation.8 cases

Problemes Encountered in Oral Appliances

Clipping at night 10 cases

Broken gutters or rods 18 cases

Many adjustments with need to frequently review the patient. 19 cases

10 Criteria for Choosing an Oral Appliance for a Patient

Temporomandibular joints, number and size of teeth, mouth opening size, bruxism or not, long or short face, man/woman, geographical location, financial cost to the patient, regular use or not, link with laboratory.

CONCLUSION

Conclusion and prospect

ENT specialists should become key players in the development of mandibular advancement devices technique, which would significantly spread over the next fifteen years: 200000 installations are planned within five years.

SM-DA-05

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Median Palatoplasty in Management of Mid Line Thick Palate,

A Missed Cause of OSA

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Objective: 1- Describe increased mid line palatal thickness as a cause of OSA which may lead to failure of UPPP - This disorder was not described in the available literature

2- Describe and evaluate median palatoplasty to manage these cases.

Materials and Methods: 14 cases having OSA were enrolled in this study, six have failed UPPP beside eight had no previous surgery. OSA diagnosis was made by history, examination, polypsomnography (PSG), wake endoscopy and CT scan. The level of obstruction was determined by sagittal CT scan or scout lateral view neck. We measured the thickness of the palate (12-18 mm) and the distance to posterior pharyngeal (3-7 mm) and compared to normal control (7-10mm and 1-14 mm respectively).

Surgery: Median palatoplasty was done through midline palatal incision dissection and excision of mid line thick fibro-fatty tissue, the muscle were sutured to increase their tone, the mucosa was closed

Results: Marked subjective & objective improvement occurred in 10 cases (71%) - partial improvement in 2 cases (14%) and 2 cases were not improved (14%).

Conclusion: mid line thick palate should not be missed as a cause of OSA, it may lead to UPPP failure. It is diagnosed by sagittal CT. It is treated by excision of the thick fibro-fatty tissue and muscle suturing.

SM-DI-01

A New Reliable Classification for Drug Induced Sedation Endoscopy (DISE)

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Purpose of Study

To develop a classification system for communicating the results of DISE that has excellent intra & inter rater reliability.

Materials and Methods Used

Croft & Pringle, VOTE, and NOHL classification systems were attempted by surgeons with little experience of DISE. Each participant's results were compared with an expert's interpretation, and using a semi-structured qualitative interview process, the difficulties encountered by the participants were explored. Using this information, a new classification system was devised which attempted to avoid the difficulties that non-expert surgeons encounter. Inter and intra reliability was assessed on the new PTLTbE system.

Results

Most participants found differentiating between 25% and 50% or 50% and 75% obstruction very difficult. Not completely understanding the difference between various types of obstruction (circumferential etc.), and how to define the most important level of obstruction was also impossible for some. Not understanding the different forms of oropharyngeal obstruction also caused some difficulties.

The new PTLTbE classification (Palate, Tonsils, Lateral wall, Tongue base, Epiglottis), has excellent reliability with an overall agreement Kappa score of 0.92 (above 0.7 is good). Even amongst those doctors with no experience of DISE the Kappa was 0.86.

Conclusion

Classifications may be used for a number of different purposes. Current classification systems attempt to accurately define the precise pathological obstruction in DISE patients. This however leads to reliability errors in interpreting DISE in non-expert surgeons. Several studies have shown the importance of experience and training to accurately interpret and record accurately the results of DISE. The authors wanted to produce a reliable classification system to be used for communication between surgeons, such as in an MDT setting or where peripheral hospitals refer patients to the central tertiary centre. The PTLTbE classification is pictorial and extremely simple, and therefore surgeons do not need to refer to the classification system during a procedure. The reliability of this system makes it useful for clinical communication and research (as artefact error no longer needs to be accounted for). We present this classification for further debate at the IFOS conference.

SM-DI-02

Comparative drug induced sleep endoscopic anatomy of the form and stuctural appearance of epiglottis of a sample of primates lesser, great apes and humans and extrapolation on breathing security of the upper airway track. .

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The comparative live endoscopic examination of a sample of primates: Lesser, Great Apes and Humans is unprecedented providing a window into the normal respiratory function in order to use an animal model and apply it to the human spectrum. Profiling the optimal model for normal respiratory function in the animal kingdom lays the foundation for understanding the abnormal respiratory function in humans especially in OSA. To our knowledge, no non-human primates were used as endoscopic anatomic models of breathing security for structural configuration of the upper airway divergent from humans. Comparative endoscopic examination was performed on a sample of primates: Golden Lion Tamarin (Leontopithecus rosalia) (n=1), Callitrhri Wied's Marmoset (n=2), (Callithrix kuhli) + Emperor Tamarin (Saguinus imperator), Pig-tailed Macaque (Macaca nemestrina) (n=2), L'Hoest's Guenon (Cercopithecus lhoesti) (n=1), great apes (non-human hominoids): Chimpanzee (Pan troglodytes) (n=1), Gorilla (Gorilla gorilla) (n=1), Orang Utan (Pongo pygmaeus) (n=2), White-handed Gibbon (Hylobates lar) (n=1), and humans: orthoganthic humans without OSA, orthognathic humans with severe OSA.

All animals were coming from La Palmyre Zoo (Les Mathes, France) except one dead Pongo pygmaeus coming from the Ménagerie du Jardin des Plantes, Muséum National d'Histoire Naturelle (Paris, France).

This endoscopic study shows paramedian soft palate shortening is accompanied by a modification of epiglottis strong U closed shape to an open U shape associated to paraepiglottic corridors in between posterior epiglottis free boards and lateral and posterior pharyngeal wall. Laryngeal upper opening is becoming more oblique posteriorly and inferiorly. Epiglottis passive posterior movement delimits paraepiglottic corridors. Paraepiglottic mucosal laxity may alter the mechanical coupling between muscular and non-muscular tissues but also obstruct these breathing contour lines of air "in-take" or "out-take". Variations of the more or less epiglottis U shape in humans seem to correlate with the risk of epiglottis posterior passive collapse. This study sheds light into the pathophysiologic processes of OSA generating options in therapeutic protocols that ultimately led to "in-out contact hypothesis," which is the establishment of ensuring the security of the respiratory corridors, critical for normal function. Disturbance of any nature with respect to these corridors may affect respiratory function and the role of the surgeon is to re-establish these respiratory corridors to its optimal model.

SM-DI-03

DISE during Cpap therapy in patients with Cpap failure

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Purpose of the study:

Continuous positive airway pressure (Cpap) often is the first choice of therapy in patients with severe obstructive sleep apnea syndrome (OSAS). However, about 30% of Cpap candidates do not respond adequately to this kind of therapy. Often patients discard the mask or dislike the unnatural way of sleeping with a Cpap. In a subcategory of Cpap failures the apnea-hypopnea index (AHI) fails to decrease to normal levels.

Materials and methods used:

Drug induced sleep endoscopy (DISE) was performed in 10 patients who maintained high AHI indices regardless of Cpap therapy. Endoscopy of the upper airway with increasing ventilation pressures was performed. An adapted Cpap mask was used that allows an endoscope to enter the nose during ventilation.

Results:

In all patients the reason of Cpap failure was recognized. The most common cause of failure was a floppy epiglottis. Other causes of failure were a laryngeal collapse, a persistent complete concentric collapse of the palate and mask problems. The use of a combined therapy of a mandibular repositioning device (MRD) together with a Cpap often resolves the problem.

Conclusion:

This new DISE technique, using an adapted Cpap mask, often determines the cause of Cpap failure in OSAS patients. In most cases an adequate therapy can be followed subsequently with good results.

SM-DI-04

Does Drug-induced Sleep Endoscopy Can Predict Success of TORS in OSA ?

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The first Transoral Robotic Surgery (TORS) for Obstructive Sleep Apnea-Hypopnea Syndrome (OSAHS) was carried out in May 2008.

After a few years, the technique was adopted with personal modifications in many ENT centers throughout the world.

Since 2008 till 2014, more than 100 cases were published in 7 single center reports in Literature.

In 2014, the first multicenter study about TORS in which a cohort of 243 cases from 7 groups in 5 different countries was available.

Today, TORS is included in the surgical routine for sleep disordered breathing (SDB) treatment in a great number of ENT departments. Although so far just few groups have series of more than 100 TORS cases, many other groups have completed more than 50 consecutive TORS for OSAHS.

It is probably one of the most published techniques in tongue base area, much more popular than the open TBRHE that inspired TORS.

According to the TORS multicenter study, 66.9% of the outcomes were successful, and 33.1% were unsuccessful with different degrees of severity. Collectively, average AHI was reduced from 43.21 ± 22.60 preoperatively to 17.54 ± 16.48 postoperatively.

Drug-induced sleep endoscopy (DISE) is a fiberoptic examination of the upper airways under proper sedation to determine the exact site of upper airways vibration / collapse in OSAHS patients. The review of sleep endoscopy findings in the literature reveals that tongue base hypertrophy is an obstructive condition in many, if not most of, OSAHS cases. Its prevalence is about 27.8% of all OSAHS cases studied by DISE i.e. more than one fourth of cases. So that it must be assessed before surgery and cannot be overlooked.

In this study, retrospective review of hospital records of patients suffering from moderate to severe OSAHS and had undergone TORS for management of tongue base hypertrophy has revealed success rate of only 66.9% (i.e. not 100%).

That was the motivation behind studying the findings of pre & post operative Drug-induced sleep endoscopy (DISE) in those patients to understand causes of failure and to achieve the best outcomes in patients where we had TORS surgical failures and to define the selection criteria for TORS with high postoperative success rate.

SM-DI-05

Drug induced sleep endoscopy for preoperative evaluation in patients with Obstructive Sleep Apnea Syndrome

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Drug induced sleep endoscopy DISE is a evaluation of the upper airway with a fiber endoscope. This examination is performed under general anesthesia. It gives informations about the upper airway volume, and during this investigation the surgeon can have much information regarding collapse and obstruction localization and degree. DISE findings are important for the treatment outcomes. The position of this presentation is in relation with the European position in the field of DISE.

We evaluate all evidence in the literature and we have compared it with our experience in the field of drug induced sleep endoscopy.

During DISE , a further comparison of the degree and level of upper airway collapse or obstruction observed during DISE versus natural sleep and awake endoscopy.

The results after DISE shows a reductions in airway at multiple regions under deep sedation with Propofol. The collaps in the retropalatal region is most frequently in patients with milde and moderate Obstructive Sleep Apnea Syndrome. This was conlude after DISE , more frequently than in awak examination. The hipopharyngeal region in much frequenly implicated in several obstructive sleep apnea Syndrome, in relation with a upper airway obstruction . The recommendation for DISE is in the selection of patients for surgical procedures and implanted upper airway stimulation.

SM-DI-06

Early Stage Clinical Validation of Drug Induced Sleep Endoscopy (DISE) Data Fusion System

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Purpose: Currently during drug induced sleep endoscopy (DISE) study, an ENT surgeon primarily views the anatomical data and cannot focus simultaneously at the anaesthetic/physiological data. Similarly, an anaesthetist solely focuses on the anaesthetic/physiological parameters and ignores the anatomical data. Both datasets are stored differently which makes data retrieval and post-processing challenging. The primary objective of this abstract is to present preliminary results using a DISE DATA FUSION system for drug induced sleep endoscopy that captures, merges, displays and stores anatomical data from an endoscopic imaging system and physiological data from an anaesthesiological monitoring system simultaneously in real time.

Materials and methods used: 15 patients with complaint of sleep disorder undergoing drug induced sleep endoscopy volunteered for an early stage clinical validation test using DISE DATA FUSION system. The data fusion system was used to capture, merge, display, and store anatomical data from an endoscopic imaging system and physiological data from an anaesthesiological monitoring system simultaneously in real time.

Results: Anatomical obstructions at different levels of the pharyngeal lumen (soft palate, velum, tonsils, oropharynx lateral wall, base of tongue, and epiglottis) with different obstruction configuration and severity were captured simultaneously in real time with its associated cardio-respiratory parameters. Furthermore, a composite data structure comprising of an anatomical image, blood oxygen level, pulse rate, blood pressure, and timestamp was created for every obstructive event. At the end of each DISE study, a video with combined dataset is produced with a frame rate of 25 frame per sound.

Conclusion: Our system provides a better way of capturing, merging, visualising, and storing anatomical data / physiological data simultaneously during DISE in real time. In addition, the proposed system creates a higher data structure resolution for describing and analysing obstructive sleep apnoea for optimising surgical decision based on DISE.

SM-DI-07

Techniques to induce natural sleep rather than light sedation for DISE

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Purpose of Study

To achieve real natural sleep in a theatre environment with nasendoscopy monitoring for Sleep Disordered Breathing (SDB) patients .

Materials and Methods

A literature search was conducted of natural sleep endoscopy techniques used before the development of DISE, with reference to further advances in the medical knowledge base of the various anaesthetic agents used to induce the sleep like sedation state used in DISE. Experience with inducing conditions as close as possible to real sleep are also explored, and compared to that seen in the sedated state.

Results

There are no clinically important differences found between the sedated state induced with propofol, to what was observed in the apparently natural sleep state. Use of Bispectral index is extremely useful in the sedated state to achieve a state similar to stage 2 sleep. With meticulous attention to environmental conditions, inducing a state as close to natural sleep is possible in the majority of patients, although nasendoscopy assessment is limited when this state is reached. The minimal differences noted between sedation and states closer to natural sleep, provide some validation for the DISE technique.

Conclusions

One of the main criticisms of DISE is the point that this state is not real sleep, and therefore there is no way of being entirely sure that this is a true representation of the naturally occurring phenomenon. This study shows that it is possible to create almost normal sleep states whilst also showing that there are minimal differences between the light sedation used in DISE and natural sleep.

SM-DI-08

Test-retest reliability of drug-induced sleep endoscopy using midazolam

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Purpose of the study: Drug-induced sleep endoscopy (DISE) has been suggested as a valuable method for determining the obstruction site causing sleep disordered breathing. However, recently questions about reliability of DISE have arisen due to a variety of previous reported DISE findings. The previous study of test-rest reliability of DISE used propofol and did not consider the depth of sleep and length of evaluation time, which could effect on the DISE findings. Therefore, we aimed to verify the test-retest reliability of DISE using midazolam, another popular sedative drug for DISE, under same setting of sleep depth and evaluation time.

Materials and methods used: Thirty-four patients diagnosed with obstructive sleep apnea were prospectively included in this study. The patients underwent two separate DISE examinations were at different days using same drug (midazolam) and technique. The two tests were conducted under same range of sleep depth using bispectral index and examination period. VOTE classification was used to classify the obstruction findings and the findings were compared between the two tests.

Results: There were 30 men and 4 women; the mean age was 45.4±13.14 years old. The mean respiratory distress index was 38.3±22.6 and the lowest oxygen saturation was 77.5±12.4%. The total dose of midazolam for the test and sleep induction period were not significantly different between the tests. Upper airway obstruction between two DISE tests showed very good agreement in the configuration as well as degree of obstruction. Reliability was higher at the hypopharynx than the palate.

Conclusions: More higher agreements were shown at our study than the previous study, which might be attributed to the same depth of sleep and length of evaluation time. DISE has a good test-retest reliability in the use of midazolam as well as propofol.

SM-DI-09

The Use of Drug Induced Sedation Endoscopy in England and Belgium

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Purpose

The purpose of this international survey is to ascertain the current use of Drug-Induced Sedation Endoscopy (DISE) in patients with Sleep Disordered Breathing (SDB) by Otolaryngologists in the United Kingdom and Belgium. We compare the results with recommendations from the European Position Paper on Drug-Induced Sleep Endoscopy.

Methods

An Internet questionnaire was circulated to Consultant Otolaryngologists, independent practitioners, and trainees across the two countries. 11 questions were used in total.

Results

181 responses from the UK and 117 responses from Belgium were received, mostly from consultants and independent practitioners. SDB was a common presentation to ENT practice, seen by over 90% of clinicians. The use of DISE varied greatly between the two countries (72.9% Belgium, 26.1% UK). 54.1% of Belgian respondents use DISE on over 50% of their patients, compared to only 32.4% of British clinicians. Attitudes of surgeons towards the diagnostic value of DISE varied; in Belgium, the majority (54%) gave a rating of 3 or more (out of 5, 5 being essential), with no respondents giving a score of 0 (useless). In the UK only 16% of respondents felt DISE had useful clinical value, with 25 respondents deeming it 'useless'. The majority opt for DISE when non-surgical therapies fail (51.4% UK, 61.3% Belgium). Majority do not use objective measures for depth of sedation (75.7% UK, 66.7% Belgium), with a marked variation on anaesthetic methods. 62.2% of UK clinicians do not use a classification system, whereas in Belgium the majority of clinicians (60.8%) use the VOTE grading system.

Conclusions

Clinicians in Belgium were more favourable to using DISE than in the UK. Differences in its clinical effectiveness were apparent between the two countries. A consensus on patient selection, method of sedation and an effective classification system seemed to be lacking from both countries. Further education is required to raise awareness for the use of DISE.

SM-DI-10

TORS for OSAS: How to improve outcomes with Drug Induced Sedated Endoscopy (DISE)

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Introduction:

OSAS has a prevalence around 30% in male adult population and became a matter of public health, with important social and finantial burden.

The gold standard treatment is CPAP, but with low long term compliance, specially in younger patients, justifying the search for other treatment options.

Regarding the surgical treatment, there are evidences suggesting that the success rate is related to patient selection, according to the site and pattern of obstruction in upper airway.

The Transoral Robotic Surgery (TORS) for tongue base reduction with expansion pharyngoplasty has demonstrated promising results for OSAS surgical treatment, but patient selection criteria still needs to improve. The drug induced sedated endoscopy (DISE) is a complementary test that is able to determine the mechanism of upper airway collapse and can be a useful tool for patient selection to this procedure.

Objective:

The objective of this study is to correlate DISE findings adopted in patient selection with TORS for OSAS treatment outcomes

Methods:

Retrospective analysis of patients submitted to TORS to treat OSAS from January 2014 to july 2016.

Were included patients with moderate to severe OSAS (PSG with AHI> 15), even with a prior surgery, not compliant to CPAP.

Drug Induced Sedate Endoscopy (DISE) was performed prior to surgery and were selected patients with oropharyngeal lateral wall collapse and tongue base obstruction due to lingual tonsil hypertrophy.

Were excluded patients when the tongue collapse was mainly related to muscle relaxation, without any lingual tonsil hypertrophy, or with craniofacial deformities.

A control PSG was performed six months after the procedure to objectively quantify the results.

We adopted an AHI below 15 as success criterion and it was correlated with DISE findings.

Results:

19 patients have completed the inclusion criterion, 17 man and 2 woman, average age of 34 years (sd 9,8) and BMI of 29,6 (sd 4,7). The average preoperative PSG was 33,8 (sd 15,2) and posoperative PSG was 7,3 (5,0). The success rate was 89%.

During TORS was removed at least 7cc with a maximum of 15 cc of lingual tonsil tissue.

Further analyzing the two non responders, the only different finding during DISE was that they presented a velopharyngeal circumferential collapse.

Conclusion:

In the present study, the DISE inclusion and exclusion criterion adopted provided good results.

Although in a small sample, there were a correlation between the surgical response and the type of velopharyngeal colapse in DISE.

SM-DI-11

TRANS ORAL DRUG INDUCED SEDATION ENDOSCOPY (TO-DISE): TECHNIQUE AND ROLE OF ORAL BREATHING

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Oral breathing during night is quite common in OSAS patients, especially in wich presented with nasal obstruction. Routinely DISE has been performed through the nostrils. In this study has been presented a DISE modified technique with a trans oral approach in order to focus also the attention on oral breathing and tongue's position and its role in the patophysiology of upper airway's collapse.

After a routinely DISE the endoscope was carried into the oral cavity through a committed device. At that level the position of the tongue was noticed, with partiuculary attention of the posteriorly falling down of the tongue and its relation with soft palate.

The osservation of the relative positions of base of tongue, uvula and soft palate was carried and noticed.

METHODS 100 patients underwent DISE-PG with the implementation of a cardio-respiratory monitoring online (PSG type 3) and trans-oral approach during sedation (TODISE) was carried out in all patients using TCI propofol sedation. PSG type 3 data, endoscopic features were noticed and recorded. All DISE procedures were carried out by the same ENT sleep apnoea expert. Baseline DISE parameters and DISE-PG parameters were compared. Nasal or mouth breathing, tongue position and secondary palatal obstruction were noticed.

About 2/3 of the patients were oral breather, 31% had tongue retroposition and 34% secondary palatal obstruction.

Mouth breathers showed retroposition of the tongue body and secondary palatal obstruction, are likely to be affected by severe OSAS, multisite obstruction and less response to non-ventilatory treatment

SM-DI-12

Understanding pathophysiology of OSA through DISE

V.Paramasivan*(1), V.Agrawal(2), S.Kishore(3), S.Bansal(4)

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Summary of symposium

Obstructive sleep apnea (OSA) is a common disorder characterized by repetitive narrowing or collapse of the pharyngeal airway during sleep. The disorder is associated with major comorbidities. The underlying pathophysiology is multifactorial and may vary considerably between individuals. However, the physiological mechanisms underlying these risk factors are not clearly understood. Successful sleep apnea surgery is based on accurately identifying where the snoring and blockage in breathing is occurring and developing targeted, effective treatment. It allows surgeons to look inside the throat with a flexible fiberoptic endoscope while a patient is sedated in a way that is similar to natural sleep.

Learning Objectives:

This symposium summarizes the current understanding of OSA pathophysiology and highlights the potential mechanisms through drug induced sleep endoscopy, which helps us to understand the airway behaviour during sleep. We will also be discussing about the correlation of AHI and level of collapse. We will be describing the techniques to perform Advanced DISE with dexmedetomidine and level 1 PSG. This symposium describes the basic principle and considerations to perfrom DISE in pediatric patients. This symposium high lights understanding of pediatric osas beyond adenotonsillar hypertrophy and also discuss the correlation between DISE and Dynamic Sleep MRI.

Speaker 1:

Title of contribution: Protocol for DISE : Our Guidelines to identify levels of Obstruction

Name: Dr. Vikas Agrawal

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Speaker 2:

Title of contribution: Advanced DISE with level 1 PSG and Dexmedetomidine

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Speaker 3:

Title of contribution: Pediatric DISE – Basic principle and Considerations

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Speaker 4:

Title of contribution: DISE - Understanding the OSA pathophysiology

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SM-DI-13

Use of a contact microphone for high-quality recording of snoring sounds during natural or drug-induced sleep

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1. Purpose of the study

Snoring is a widespread clinical problem, and part of the spectrum of obstructive sleep apnoea hypopnoea syndrome (OSAHS). Surgical and non-surgical interventions for snoring can be targeted using drug-induced sedation endoscopy (DISE), which is a dynamic investigation that can identify the site and pattern of pharyngeal collapse responsible for sound production. DISE remains controversial due to inconsistencies in anaesthetic protocol, classification and scoring of finding, inter-observer variability, and the fact that drug-induced sedation is only an analogue of natural sleep.

Detailed analysis of snoring sounds may potentially allow "acoustic fingerprinting", and correlation with underlying anatomical sites of snoring. Authors have explored this possibility using environmental microphones in the past, finding that the centre frequency of palatal snoring was lower than that of tongue base snoring [Quinn et al. 1996].

2. Materials and methods

We have conducted recordings of patients' snoring sounds under a standard drug-induced sedation endoscopy protocol, as part of a pilot observational study. We utilise a novel two-channel technique, with a contact throat microphone (CTH100, Clockaudio Ltd., Waterlooville, UK), positioned adjacent to the patient's thyroid cartilage, and a high-quality balanced environmental microphone positioned at a standardised distance from the patient. High definition recordings (24 bit depth, 96 kHz sampling frequency) are created digitally via a USB-powered analogue-digital converter, using Wavelab 6 (Steinberg Media Technologies GmbH, Germany).

3. Results

The analysis of the generated recordings was based on the application of entropic/information metrics of organization, such as the Shannon entropy, Rényi entropy, Tsallis entropy, normalized Tsallis entropy and Fisher information. Preliminary results demonstrate that snoring sounds generated by distinct anatomical subsites, for example the tongue base can be correlated to these metrics.

4. Conclusion

There are several potential benefits of this novel technique. The simplicity of using the contact microphone makes it possible to integrate the recording method, if validated, into the existing protocol for limited polysomnography. Further analysis via multiple signal features may potentially allow deduction of the anatomical site of origin through acoustic methods alone, removing the need to perform more invasive testing in straightforward cases.

Mr Thomas Jacques ENT Specialty Registrar, St. Mary's Hospital, London, UK

Dr George Korres Senior Clinical Fellow, Central Manchester University Hospitals, UK

Dr Stylianos Potirakis Associate Professor, Piraeus University of Applied Sciences, Aigaleo, Greece

SM-FR-01

Obstructive sleep apnea syndrome: is it frequent and underestimated?

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L'objectif du travail est d'étudier la fréquence du syndrome d'apnée obstructive du sommeil à la consultation ORL.

Matériel et méthodes : Nous avons mené une étude transversale sur les malades consultants en ORL quels que soient leurs motifs de consultation. Nous avons opté pour un échantillonnage probabiliste exhaustif et représentatif. Nous avons inclus 250 patients dont 200 sont retenus pour l'analyse par le logiciel epi info. Les critères d'exclusion sont les sourds-muets, les enfants de moins de 4 ans, les patients non consentants. Les enquêteurs sont les médecins ORL à la consultation et le moyen de collecte des données est le questionnaire utilisé est celui du groupe du sommeil de la SFORL. Les variables à l'étude sont les caractéristiques sociodémographiques, les antécédents ORL et généraux, le principal motif de consultation, les habitudes du sommeil, la sémiologie clinique du SAOS (ronflement, céphalées matinales et réveils nocturnes) et l'Echelle de somnolence diurne d'Epworth. Nous avons proposé une polygraphie du sommeil chez les patients suspects de SAOS et consentants.

Résultats : Nous avons retenu 200 patients. Les Hommes représentent 39,5 % versus 60,5 % femmes. La moyenne d'âge était 40,4 avec un écart type de 15,9. Un antécédent ORL était noté dans 37 %. Le ronflement était le motif de consultation dans seulement 4 % des cas alors qu'il était constant dans la nuit chez 11 % des patients et fréquents chez 16 %. L'ancienneté du ronflement était notée dans 42 % des cas (plus d'un an). La survenue d'apnées nocturnes et de céphalées matinales était rapportée dans 26 % des cas. Le score d'Epwort était entre 10 et 23 dans 35 %. La polygraphie réalisée chez 25 patients avait confirmé le SAOS dans 90 % des cas.

Conclusion : Le SAOS reste une pathologie sous estimé et sous diagnostiquée. Place de l'ORL est primordiale pour le dépistage précoce permettant l'éviction des complications cardiovasculaire, respiratoire et accidents de la voie publique.

SM-FR-02

PLACE OF SURGERY IN THE TREATMENT OF CHRONIC RHONCHOPATHY ABOUT 105 CASES.

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Objet :

L'efficacité des traitements chirurgicaux dans la rhonchopathie chronique est difficile à évaluer, en raison de l'hétérogénéité des critères d'évaluation, du recul et de la méthodologie des études. Le but de notre travail est d'évaluer nos résultats et d'identifier les facteurs de succès et d'échec des différentes techniques chirurgicales afin de dégager la place de chaque technique dans la stratégie thérapeutique de la rhonchopathie chronique.

Méthodes :

Etude rétrospective à propos de 105 malades traités chirurgicalement pour rhonchopathie chronique. Les différentes techniques utilisées : l'Uvulo-palato-pharyngoplastie (UPPP), septoplastie, turbinoplastie, radiofréquence du voile du palais.

Résultats :

Une disparition ou une diminution de plus de 50% de la sonorité du ronflement a été notée dans 73,3% des cas à 1 mois de la chirurgie alors qu'un échec a été observé dans 26,7% des cas. Ce taux de succès a baissé à 66% des cas à 3 mois et à 54% des cas après 6 mois. A un an du traitement, le taux de succès reste sensiblement le même qu'à 6 mois.

Le taux de succès de la chirurgie était de 62% en cas de ronflement simple et 38% chez les apnéiques. Ce taux a passé de 64% chez les non obèses à 26% en cas d'obésité. Le taux de succès de l'UPPP était de 64% dans le groupe de ronfleurs simples et de 35,4% dans le groupe de malades présentant un SAOS.

Le recul moyen dans notre étude était de 3 ans 6 mois (6 mois-7ans).

Une récidive du ronflement a été notée dans 19% des cas.

L'étude analytique a trouvé :

- **En cas d'UPPP : L'aspect du voile ainsi qu'un IAH préopératoire inférieur à 30 étaient des facteurs de succès alors qu'un cou court, un rétrognatisme et une obésité constituaient des facteurs d'échec de la chirurgie.**
- **En cas de septoplastie : L'obésité, un cou court et des antécédents d'atopie étaient des facteurs d'échec.**
- **En cas de radiofréquence du voile : L'obésité, l'hypertrophie des amygdales palatines ainsi que la présence d'une luette longue n'étaient pas des facteurs influençant les résultats thérapeutiques.**

Conclusion :

L'étude analytique nous a permis d'identifier les facteurs de succès et d'échec du traitement chirurgical et de dresser par la suite un profil de malades à opérer. Les indications des différents outils thérapeutiques se sont de plus en plus raffinées.

SM-MMA-01

Changes in facial profile after maxillomandibular advancement surgery for obstructive sleep apnea syndrome

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The aim of this study was to assess changes in the profile of adult male patients treated for obstructive sleep apnea syndrome (OSAS) with maxillomandibular advancement (MMA) surgery and to measure patient perception of changes compared with that of different panels.

Materials and methods: Fifteen consecutive apneic patients displaying a wide variety of morphological types, mean age 42 years (20–59), a BMI of 26.60 kg/m2 (22–29), a mean initial Apnea Hypopnea Index (AHI) of 50.9 (19–85), underwent MMA. Assessment was done by facial photography, lateral cephalographs (Tweed analysis modified by Riley and Delaire architectural analysis), polysomnographic records and a validated self-assessment questionnaire. Patients' pre- and postoperative profiles were taken from photographs using Photoshop 7_ software. Their darkened outlines were shown randomly in positions A or B (pre- and postoperative) to panels composed of orthodontists (n = 40), fine arts students (n = 50) and lay persons (n = 50) who were requested to choose the most attractive profiles.

Results: The MMA success rate for OSAS was 80% (12/15) for an AHI less than 15, with no surgical complications. All patients reported a reduction of their symptoms and 14 out of 15 were satisfied with the esthetic outcome. Mean advancement was 8.4 mm (3.0–10.0) for the maxilla and 10.8 mm (10.0–13.0) for the mandible. Following MMA, 12 out of 15 exhibited maxillary protrusion and six out of 15 mandibular protrusion. The mean change in the nasolabial angle was _ 5.7_ (_ 27_ ;

14_). The postoperative profiles were preferred by 85% of the combined panels (P = < 0.001), showing no significant difference from one panel to another. No skeletal characteristic could be correlated with the esthetic preference. Upper lip retrusion, open nasolabial angle and dolichofacial type emerged as positive preoperative predictors of esthetic preference.

Conclusion: The profile changes following MMA were favorably perceived in the majority of cases. However, specific orthodontic preparation could be offered to patients with pronounced preoperative protrusion.

SM-MMA-02

Customized orthodontic preparation for patients with high aesthetic demands before maxillomandibular advancement for obstructive sleep apnea.

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Introduction: Maxillomandibular advancement surgery (MMA) is the most effective surgical treatment for obstructive sleep apnea (OSA) in adult patients, when conservative treatments failed. To be effective, MMA must reach at least 10 mm, resulting in potentiallly major changes of facial appearance, that patients might refuse.

Objectives/Aim : To design customized orthodontic protocols for OSA adult patients requiring MMA.

Methods: 70 consecutive adult OSA patients (mean age 41,3±1, BMI 25,47±0,6 kg/m2) with a baseline Apnea Hypopnea Index (AHI) of 46.6±9,6/h, underwent MMA. They were evaluated with facial digitalized photographs, lateral cephalographs and polysomnographic records. Prior to surgery, a direct simulation test was performed to evaluate facial changes. Orthodontic preparation was proposed according to occlusal and aesthetic implications.

Results: 36 patients (51%) had orthodontic preparation for MMA. All patients were clinically improved after MMA with a post-operative AHI of 8±3 for the orthodontic group (BMI 24,8 Age 42) and AHI of 10±6 for the non-orthodontic group (BMI 26, Age 40). 57% of orthodontic patients were class II division 2 with retruded profiles, 6% were protrusive cases requiring extractions; 12 % were compensated class II malocclusions (upper premolar extractions or lower incisor's proclination), 27% had a previous history of orthodontic treatment with bicuspid extraction. Mean treatment time was 20,22 months (15,1±7,before surgery,5±7,3 after); 2 patients had surgical maxillary expansion combined with MMA; osseous anchorage (mini-screws) was required for 4 patients to reduce dental protrusion.12 patients were treated with lingual appliance/22 with buccal brackets.

Conclusion : Specific orthodontic protocols can be designed for patients requiring MMA surgery for OSA, resulting on improvement of sleep parameters and aesthetic results.

SM-MMA-03

Does the efficacy of oral appliance therapy predict the surgical success of maxillo-mandibular advancement surgery for obstructive sleep apnea syndrome?

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Objective: To determine if the efficacy of oral appliance therapy (OAT) was related to the outcome of maxillo-mandibular advancement surgery (MMA) for obstructive sleep apnea syndrome (OSAS).

Methods: A retrospective clinical study included 49 consecutive patients, aged 42.0 ± 9.9 years, BMI 26.2 ± 3.2 kg/m2, Respiratory Disturbance Index (RDI) 48.3 ± 11.8/h, selected for MMA after CPAP rejection, including 24 subjects who had a first stage OAT before surgery (aged 42.6 ± 10.4 years, BMI 25.6 ± 2.6 kg/m2, RDI 46.9 ± 10.4/h). All subjects underwent full night sleep studies, and cephalometric data were collected at baseline and after surgery. A sleep study was performed after OAT titration in the OAT subgroup. Success with either treatment was defined as a post-treatment RDI < 20/h and a minimum 50% decrease in baseline RDI. Descriptive analyses and performance characteristics of OAT for predicting the success of MMA were determined.

Results: No significant difference was observed regarding age, weight, severity of the OSAS, and cephalometric characteristics in the OAT subgroup as compared to the whole group. OAT was successful in 67% of cases. MMA was successful 87.5% and 87.8% in the OAT and the whole group, respectively. Sensitivity of successful OAT was 71.4%, specificity 66.7%, positive predictive value 93.8%, and negative predictive value 25%, for the prediction of surgical success in the OAT subgroup.

Conclusion: OAT was useful to predict the success of MMA in our OSAS patients. Prospective studies are needed to confirm that OAT can help patient selection for MMA.

SM-MMA-04

External framework surgery Vs Soft tissue surgery for OSAS

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External framework surgery & Soft tissue surgery are the surgical options available for obstructive sleep apnea (OSA). MMA involves forward-fixing the maxilla and mandible approximately 10 mm via Le Fort I maxillary and sagittal split mandibular osteotomies.

We retrospectively reviewed outcomes from our OSA patients who underwent MMA. MMA resulted in an 81% reduction in the group mean apnea-hypopnea index (AHI) per polysomnography an average of 7 months after surgery. Fifty four percent (54%) of patients achieved a post-MMA AHI of less than 5 events/hour sleep and 76% achieved an AHI less than or equal to 10 events/hour sleep.

We have also reviewed outcomes from our OSA patients who underwent Soft tissue surgery on palate and tongue base which resulted in 83% reduction in the group mean apnea-hypopnea index (AHI) per polysomnography an average of 11 months after surgery. Sixty-six percent (66%) of patients achieved a post-MMA AHI of less than 5 events/hour sleep and 72% achieved an AHI less than or equal to 10 events/hour sleep.

Considering that the impact of Bony framework surgery and Soft tissue surgery on AHI is more substantial, the results have been replicated at multiple institutions and that the AHI response appears durable for at least at 2 years, we can recommend Multilevel surgery in patients seeking a surgical approach to their OSA for those who is not willing to use CPAP.

Speaker 1:

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SM-MMA-05

Maxillomandibular advancement and midline glossectomy in the treatment of moderate and severe OSAS

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Objective: the purpose is to describe the results of the maxillomandibular advancement and midline glossectomy with CO2 laser in the treatment of patients with moderate and severe OSAS.

Subjects and methods: A retrospective study on a total of 33 consecutive patients with moderate and seve OSAS treated with the combination of MMA and MLG. Diagnostic, polysomnography pre and post-operatively, and the data analyzed included AHI, percentage of time spent in sleep stages N1, N2, N3 and REM, and the total number of minuts with oxygen saturation below 90%.

Results: pre-operative values include a mean AHI of 48±SD 29.5 minutes. The pos operative values incude a mean AIH of 9.2±SD 11.4 events/hour and total number of minutes with oxygen saturation below 90% of 3.2±SD 6.3 minutes. Cephalometric in 22 patients demostradted a significant improvement in all parameters; Pre- operative values for SNA, SNB and PAS were 80.4±3.5, 76.7± 5.3 and 7.0± 2.1 respectively. Post operative SNA, SNB and PAS were 86.3±5.0, 81.3±4.1 and 13.2±2.7. Cure as defined by hour and a 50% reduction in overall AHI was seen 29/33 (87,3%) patients.

Conclusion: The MMA and MLG with CO2 laser was safe and highly effective in the treatment of patitens with moderate and severe OSAS

SM-MMA-06

Outcomes of Maxillo-Mandibular Advancement for Patients with Down Syndrome and Refractory Obstructive Sleep Apnea

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PURPOSE OF THE STUDY. While maxillo-mandibular advancement (MMA) is reported to be greater than 90% effective in treating obstructive sleep apnea (OSA), there are no reports of its use for children or adults with Down syndrome (DS). Our aim was to determine the effectiveness of MMA for patients with DS and OSA.

MATERIALS AND METHODS. Case series of all patients with DS and OSA who underwent MMA with polysomnographic data at a single institution.

RESULTS. We identified two patients; both had midface hypoplasia and class III malocclusions. The first was a 24 year-old male with an obstructive apnea-hypopnea index (oAHI) of 86 events/hour and oxygen nadir of 79% despite previous tonsillectomy, tongue base reduction, partial glossectomy and palatoplasty. His pre-surgical sleep efficiency was 38.9%, with REM sleep constituting only 1.4% of total sleep time. After MMA, his oAHI was 15.8 events/hour and oxygen nadir was 82.5%. His sleep efficiency improved to 60.5%, and REM time increased to 19.3% of total sleep time. His post-operative course was complicated by airway obstruction and cardiorespiratory arrest requiring tracheostomy. The second patient is a 13 year-old female with a history of aggression, self-mutilation, adenotonsillectomy and lingual tonsillectomy with a residual oAHI of 7.2 events/hour and oxygen nadir of 93%. Her preoperative sleep efficiency was 89.8%, with 15% REM. After MMA and tongue suspension, her oAHI improved to 2.1 events/hour, oxygen nadir to 96%, and sleep efficiency to 94%, with 35% REM sleep. Her postoperative course was complicated by behavioral issues, self-mutilation and local trauma leading to an odontogenic infection. Six weeks after surgery, her mother reported improvement of her quality of sleep and psychiatric and behavioral issues.

CONCLUSION. This is the first report of MMA use for patients with DS and OSA. Both patients had a significant improvement in oAHI and other sleep parameters but the first continued to require therapy for residual moderate OSA.

SM-NSD-01

A comparison of minimal cross sectional areas, nasal volumes and peak nasal inspiratory flow between patients with obstructive sleep apnea and healthy controls

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BACKGROUND: The differences in nasal geometry and function between OSA patients and healthy individuals are not known. Our aim was to evaluate the differences in nasal geometry and function using acoustic rhinometry (AR) and peak nasal inspiratory flow (PNIF) between an OSA population and healthy controls.

METHODOLOGY: The study was designed as a prospective case-control study. Ninety-three OSA patients and 92 controls were enrolled from 2010 to 2015. The minimal cross-sectional area (MCA) and the nasal cavity volume (NCV) in two parts of the nose (MCA0-3/NCV0-3 and MCA3-5.2/NCV3-5.2) and PNIF were measured at baseline and after decongestion.

RESULTS: The mean MCA0-3 in the OSA group was 0.49 cm2; compared to 0.55 cm2 in controls. The mean NCV0-3 correspondingly was 2.51 cm3 compared to 2.73 cm3 in controls. PNIF measured 105 litres/minute in the OSA group and 117 litres/minute in the controls.

CONCLUSIONS: OSA patients have a lower minimum cross-sectional area, nasal cavity volume and peak inspiratory flow compared to controls. Our study supports the view that changes in the nasal cavity may contribute to development of OSA, but it is by no means clear as to what causes the difference in nasal geometry between OSA patients and healthy individuals. The results points to a possible reduction in the bone-mucosa ratio in OSA patients, and inflammatory pathways in the nasal mucosa might be a causal factor.

SM-NSD-02

PREVALENCE OF SLEEP APNEA IN PATIENTS WITH VARIOUS DISEASES

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Sleep apnea is the most general problem around the world of last days. Sleep apnea is the intermittent cessation of airflow at the nose and mouth during sleep. The present day sleep apnea is an actual problem and considered as a reason of chronic weakness and reduction of quality of patient's life.

The purpose of this study was to determine the prevalence of sleep apnea in patients with various diseases.

Materials and methods. We studied 150 patients who applied to the reception department of the 2nd Clinic of the Tashkent Medical Academy in 2014-2016.

Results and discussion. The study showed that in 32 (20%) patients complained of fatigue, headache. According to family history in 32 (20%) patients found obstructive sleep apnea. 22 (68,7%) patients were male, and 10 (31,3%) - female. It is also revealed that 78,0% of patients with obstructive sleep apnea is defined Drug-Resistant Hypertension, 68,7% - Obesity, 62,5% - Congestive Heart Failure, 56,2% - Pacemakers, at 46,9% - Atrial Fibrillation, in 43,0% - Diabetes, 37,5% - All Hypertension, 31,2% - Coronary Artery Disease. In addition, risk factors for obstructive sleep apnea patients has been identified. The main risk factors were male gender, obesity, diagnosis of hypertension, excessive use of alcohol or sedatives, upper airway or facial abnormalities, smoking, family history of obstructive sleep apnea, large neck circumference, endocrine and metabolic disorders.

Conclusion. Given the above, it follows that obstructive sleep apnea has a tendency to develop disorders of body functional structures that give rise to various diseases.

SM-NSD-03

Surgical treatment with radiofrequency thermotherapy

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Outcome: During the last 15 years polysomnography has been accepted as a gold standard in sleep medicine. The frequency and location of obstructions play a crucial part in the planning of surgical treatment, which can be achieved with different techniques.

Methods: Our experience shows that Apnea Grapf 200 is a more reliable method for exact detection of level of obstruction. Our team uses Apnea Grapf 200 in patients with OSAS and snoring since 2013. In all cases has been previous by done polysomnographic analysis.

Results: In 4 cases we detected upper obstruction at the level of lower nasal concha and nasal septum. In 5 patients we found combined obstruction of the level of soft palate and uvula. In 1 case the obstruction was found at the level of the lingual tonsila.

Discussion: Inn all cases we proposed surgical treatment with radiofrequency thermotherapy and in some cases septoplasty.OSA can present significant challenges in providing postoperative care. A comprehensive evidence-based checklist can improve patient's safety and direct the management of postoperative care for diagnosed or suspected OSA patients throughout their hospitalization.

The specific interventions include guidelines for postoperative assessment, continuous monitoring, extubation readiness, pain management, sleep positioning, respiratory monitoring as well as OAT or CPAP therapy.

Conclusions:Apnea Graph 200 shows excellent results in the diagnosis of OSAS and snoring. Diagnostic information on type, severity and location of OSA. Guidance to optimum treatment e.g. surgery, mandibular advancement and CPAP.

SM-OD-01

A multidisciplinary approach for personalized treatment of OSAS patients: A retrospective analysis

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PURPOSE OF THE STUDY: To retrospectively evaluate the effectiveness of a multidisciplinary assessment in OSAHS patients not candidates for mild disease or not tolerant to CPAP treatment. The patients were evaluated for alternative or complementary treatments by a multidisciplinary team composed of a pulmonologist, an otolaryngologist, and maxillofacial surgeons.

MATERIAL AND METHODS: We performed a retrospective observational analysis of the patients' charts discussed during the multidisciplinary meetings between March 2015 and October 2016 in our hospital. The inclusion criteria were: patients with previously detected OSAHS on the basis of a polysomnography, patients candidates but not compliant to CPAP trial, patients with residual post-surgical OSAHS, patients candidates to nasal surgery in order to improve CPAP tolerance. Patients with severe comorbidities were excluded.

RESULTS: The OSAHS multidisciplinary team met 11 times and evaluated 73 patients, including 55 male (75%) and 18 female (25%) with a mean age of 53.46 (+/- 13.7 SD) years. Mean Apnea/Hypopnea Index (AHI) was 31.56 (+/- 21.79). Twenty-one patients had mild OSAHS (5<AHI<15), 23 had moderate OSAHS (15<AHI30/h). Twenty-nine patients were included in the conservative treatment group (orthodontics evaluation for oral appliance in 22 patients, nutritional program in 2 patients, positional therapy in 5 patients); 7 patients needed a second-level evaluation (drug-induced sleep endoscopy) to decide whether and which surgical program could be useful. ENT surgery (nasal surgery, palatal surgery, epiglottic surgery or multilevel surgery) was proposed in 12 cases, while maxillofacial surgery and bariatric surgery were indicated respectively in 13 and 3 patients. CPAP was considered as the optimal treatment in 8 patients. A significant reduction in the number of patients not receiving any treatment was attested after the multidisciplinary assessment (28% vs. 3%; p<0.001)

CONCLUSIONS: A multidisciplinary approach in OSAHS patients allows a better therapeutic stratification and can be useful to find more treatment options and to reduce the number of patients not receiving any treatment

AUTHORS

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SM-OD-02

Correlation Between the Clinical and Polysomnographic Parametres in Patients With Obstructive Sleep Apnea Syndrome

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Purpose of this study: The aim of this study was to determine the correlation between clinical parametres such as age, gender, obesity, body mass index (BMI), neck circumference, Epworth sleepiness scale (ESS), Friedman palate position, Friedman staging scale and apne hypopnea index (AHI) in patients diagnosed with Obstructive Sleep Apnea Syndrome (OSAS); find out predictive value of clinical parametres for choosing patients for polysomnography (PSG), detecting individiuals with suspected OSAS and determining OSAS severity.

Materials and methods used: The study was performed on 200 cases which where diagnosed with OSAS among 427 individuals that were performed PSG for suspected OSAS at Ankara University Otolaryngology-HNS Department between 07/2013 – 07/2016. Datas in this study were obtained retrospectively from the database of Ankara University Otolaryngology-HNS Department and from the files special for patients undergoing PSG.

Results:

- OSAS may be seen at any age. There isn't any correlation between age and OSAS severity/AHI.

- When we look at the correlation between sex and AHI in our study there was a relative high AHI on male individuals but this wasn't statistically significant.There wasn't a negative or positive correlation between sex and AHI.

- When we look to the relation between obesity and OSAS severity/AHI; obesity is predisposing factor for OSAS but all of patients with OSAS are not obese. OSAS may be seen also in non-obese individuals.

- There is a positive correlation between BMI and OSAS severity, AHI increases relatively with BMI and AHI has the highest value at morbid obese group.

- When we look to the relation between neck circumference and AHI; neck circumference of severe OSAS patients are statistically higher than the individuals with mild and moderate OSAS.

- When we look at the correlation between EUS and AHI; there was a relative high EUS on individuals with severe OSAS but this wasn't statistically significant.There wasn't a negative or positive correlation between EUS and AHI.

- There wasn't any negative or positive correlation between Friedman palate position, Friedman staging scale and AHI.

Conclusion: Polysomnograpy is valuable, golden standart diagnostic tool for diagnosis, treatment and control of patients with OSAS. However PSG is an expensive, time consuming, special team requiring test and the PSG laboratory quantity is very restricted. BMI and neck circumference values are important parameters to differantiate the cases who are going to be referred to PSG.

SM-OD-03

DEEP LEARNING FOR BREATHING SOUND ANALYSIS IN OBSTRUCTIVE SLEEP APNEA

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Purpose

Breathing sounds during sleep are disturbed in patients with obstructive sleep apnea (OSA) and characterized by various acoustic properties. This study aimed to analyze breathing sound recorded during sleep based on a deep learning approach and detect the severity of OSA.

Methods

Patients who visited a sleep center because of snoring or cessation of breathing were enrolled and underwent an full-night polysomnography (PSG). The audio data of sleep breathing sound was obtained using a microphone equipped in the PSG. The patients were divided into 4 severity groups based on apnea hypopnea index (AHI) from PSG: normal (AHI < 5); mild (5 ≤ AHI <15); moderate (15 ≤ AHI <30); and severe (AHI ≥ 30. The audio data of each patient was preprocessed to eliminate various noises. After the whole night audio data of each patient was divided into 5-second windowed signals, audio features were extracted from each 5-second window. Audio features that could discriminate OSA severity groups were selected and used for a 4-severity group classification task based on deep neural network. The deep neural network model included 2 hidden layers with 50 and 25 nodes, respectively. Five-fold cross validation was used for training and testing the OSA severity group predicting model.

Results

Audio data were obtained from 120 patients (80 men and 40 women) and each of 4 severity groups included 30 patients. A total of 311 audio features were tested and 132 features were selected as OSA severity group discriminators: 52 for normal; 0 for mild; 7 for moderate; and 63 for severe groups. For the deep neural network model, 98 audio features were learned after overlapping features between groups were excluded. Using 5-fold cross validation, we achieved an accuracy of 73.3% and a specificity of 91.7% in the 4 OSA severity group classification.

Conclusions

Our deep learning approach demonstrated that the audio data of a subject may be useful in prediction of the OSA severity. This study has an implication that any device with a microphone, a smartphone for instance, may have a potential to be utilized as a screening tool for detection of OSA.

SM-OD-04

Dexmetedomidine during sleep nasoendoscopy (SNE) our experience

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Purpose of the study

Obstructive sleep apnea (OSA) is a chronic, highly prevalent, multisystem disease, which is still largely underdiagnosed. Understanding the sites of pharyngeal collapse is mandatory for surgical treatment decision-making in obstructive sleep-apnea-hypopnea syndrome patients, drug-induced sleep endoscopy (DISE) has emerged as a particularly useful tool to augment findings from traditional physical examination during wakefulness for adult case.

Materials and method used

Dexmedetomidine is a high selective α-2 adrenergic receptor agonist with anxiolytic and analgesic effects, does not depress respiratory function and has a wide safety margin. The nares were anesthetized with 1% lidocaine. Our study was conducted on 15 patients in ASA STATUS I-II, aged between 30-60 years old, considering OSAS diagnosed by polysomnography.

Patients were taken to the operating room. A balanced crystalloid 8 mL/h infusion was applied for 20 minutes. Mean arterial pressure (MAP), peripheral oxygen saturation (SpO2), heart rate (HR), respiratory rate (RR) values and Ramsey Sedation Scores (RSS) were recorded. At all patients were administered iv dexmedetomidine (Dexdor, Orion Pharma, Italy) with the loading dose of 1 mcg/kg for 10 minutes followed by the maintenance dose of 0.3 mcg/kg/h. The maximal dose to be infused was planned as 0.8 mcg/kg/h. All patients received 2 L/minutes oxygen during the procedure through a nasal cannula.

Results

Drug-induced sleep endoscopy using dexmedetomidine lasted 23.4 ± 2.5 minutes, from the beginning of the infusion until it was stopped. In all patients, more than one obstruction zone was observed with dexmedetomidine: 58% of the patients had obstructions in three zones, 27% in all four zones, and 25% in two zones.

No patient experienced hypotension/hypertension, bradycardia, desaturation under 93% SpO2 or an acute reversal of sedative and analgesic effects.

Conclusion

Dexmedetomidine allows the best functional assessments, more connected to the physiological status. It caused less hypotonia and muscle relaxation, reduced collapse of tongue base, better reproducibility apnoea cycles, muscular effort, snoring, arousal. Also provided greater hemodynamic stability and less respiratory depression.

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SM-OD-05

Diagnostic Accuracy of Split-Night Polysomnography for Obstructive Sleep Apnea

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Background & objective

Split-night PSG improves efficiency of sleep testing and reduces time-to-treatment for OSA patients. AASM guidelines recommend to perform split-night PSG only if AHI ≥40/h over the first 2hr. However, the diagnostic validity of this PSG is still uncertain. This study is aimed

to test the accuracy of split-night PSG, including an investigation of the optimal AHI cut off point and minimal period of PSG.

Materials & methods

108 standard full-night PSG were included. Data were computerized to obtain first 2hr and 3hr PSG as a split-night PSG data. AHI and RDI were counted in each period of time. Diagnostic accuracy of split-night PSG was analyzed using intraclass correlation coefficients(ICC). Optimal AHI threshold & period of PSG were compared by receiver operating characteristic (ROC) curve and the area under the curve (AUC).

Results

The 2hr PSG with AHI cut point 40/h (Split-night PSG) had strong correlation with full-night PSG (ICC 0.934, AUC 0.954). Cut off point at AHI ≥30/h gave better accuracy, ICC and AUC comparing with AHI ≥40/h (accuracy 85.18%, ICC 0.943, AUC 0.965). Using 3hr PSG, result shown higher yield than 2hr PSG (ICC 0.983, AUC 0.980).

Conclusion

Split-night PSG following AASM guideline is a sufficiently accurate diagnostic test of OSA. 3hr PSG testing results in a better yield than 2hr PSG. AHI cut off point at 30/h is suggested for split-night PSG protocol as it presented a similar result as 40/h but provided for more CPAP-needed patients.

SM-OD-06

Incidental findings on upper airway CT in patients with sleep-related breathing disorder

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Purpose: Sleep-related breathing disorder (SRBD) may cause the ventilatory disturbance such as sleep apnea or hypopnea. To diagnose the SRBD and evaluate the narrowed portion of the upper airway, various methods including polysomnography (PSG), simple X-ray, fluoroscopy, CT, MRI or endoscopy, etc would be used. CT is generally used to evaluate the anatomical factor of the the upper airway associated with SRBD.

The purpose of this study is to evaluate the additional incidental findings besides the anatomical factor of the the upper airway associated with SRBD by UACT.

Material and methods : A total of 378 participants (304 males, 74 females) were evaluated by medical records, UACT and PSG. UACT was underwent from skull base to tracheal carina to examine the upper airway.

We analyzed the incidental lesions which were detected during the evaluation of the SRBD.

Results: Of the 378 patients, seventy four patients had lesions that were unrelated to SRBD. Among the 74 patients (male: 59, female: 15), 32 cases of sinusitis, 16 cases of thyroid disease, 6 cases of lymphadenopathy, 6 cases of brain lesions, 3 cases of pulmonary tuberculosis, 2 cases of vallecular cyst, 1 case of pulmonary nodule and 9 other cases were found. The number of patients who underwent the medical treatment were 25, and 11 patients had the surgical treatment.

Conclusion: Clinically important diseases can be incidentally detected from UACT and it is necessary to evaluate and manage the suspected diseases carefully.

SM-OD-07

Introducing the STAMP Questionnaire for Obstructive Sleep Apnoea (OSA)

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Purpose of Study

To develop a Patient Reported Outcome Measure (PROM), that can be used in a busy Sleep Clinic for OSA patients.

Materials and Methods Used

The frequency and importance of 200 OSA patient symptoms, were documented and analysed. These were then subcategorised into Symptoms, Tiredness, Alertness, Mood and Psychosocial domains (STAMP), and each of the top 25 questions were given a 6 point Likert scale score (0-5), to give a total score from 0 to 100. Face validity, Principal Component Analysis, Cronbach's Alpha and other measures of validity were used to interrogate the data and the PROM itself. Responsiveness and disease stratification were measured using the patient's own subjective assessment and the results of pre and post treatment polysomnography results.

Results

The STAMP questionnaire has undergone four minor revisions (to date), to improve the quality of its measurement and the validity of its score. Currently a normal population score is between 0-30, upper airways resistance syndrome generally elicits a score between 30-50, and OSA patients generally score above 50 depending on their AHI.

Conclusions

A systematic review into OSA PROMs by the authors has shown that most current questionnaires were not developed using OSA patients in the initially stages. The vast majority of these were either too long or explored only one subdomain of OSA, which meant that they cannot be used in a busy clinical setting. This questionnaire is being developed as a quick 2-4 minute PROM which can be used to provide a useful measure of OSA severity.

SM-OD-08

New diagnostic device for the assessment of sleep related breathing

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Sleep apnea is recognized as a serious health problem as it affects about 20% of adults and 1%-3% of children worldwide.

Nowadays, unfortunately, more than 80% of the adults presenting with this pathology remain unrecognized and thus untreated at all. Fatal cases are not any rare finding, indeed.

A retrospective problem-oriented search of ours (Milkov, 2012) on pediatric OSA in Web of Science, MEDLINE and Scopus for the recent 30 years shows a steady world publication output increase. There are 4192 publications in 874 journals in MEDLINE and 687 papers in 144 journals in Scopus. In 1985-2010 only, more than 8100 authors from 64 countries published 3213 papers in 626 journals and 256 conference proceedings abstracted in Web of Science.

Apnea Grapf Spiro is an ambulatory polygraphic system developed for the more detailed diagnostic needs of innovative OSA treatment alternatives as well asestablished surgical OSA treatments.This device provides information on: differentiation of SRBD, obstructive differation of central vs obstructive respiratory events, Snoring , respiratory related arousals and obstructions limited to distinct sleep position.

In conclusion, it should be emphasized that a complex interdisciplinary approach involving specialists in otorhinolaryngology, lung medicine, dental medicine, and psychology is needed to successfully treat OSA in adults and children.

SM-OD-09

Obstructive Sleep Apnea Syndrome- diagnostic and treatment possibilities - East Europe Concept

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Obstructive Sleep Disorders includes clinical entities from snoring to obstructive sleep apnea Syndrome(OSAS). Adenotonsillar Hypertrophy, in relation with craniofacial abnormalities, obesity, and neuromuscular disorders, are the most important causes for sleep disorders breathing. Symptoms and signs of OSAS are classified into those directly related to the intermittent pharyngeal airway obstruction (e.g., parental report of snoring, apneic events) and into morbidity resulting from the upper airway obstruction (e.g., increased daytime sleepiness, hyperactivity, poor school performance, inadequate somatic growth rate or enuresis).Polysomnography is the important gold standard for diagnosis of sleep disorders breathing. It has an important value, but not alone, just in correlation with clinical examinations , anamnesis and history. MRI of upper airways gives important anatomical elements, which can produced obstruction in the upper airways. To evaluate the obstruction degree, and obstruction or collapse region, it is necessary to perform drug induced sleep endoscopy. The dynamic mechanics of the upper airway , especially in children is an subjective investigation, regarding physician experience and in collaboration with a very good anesthesiologist. After correlation between clinical and polisomnographical results, the expert in Somnology, has the possibilities to establishing the diagnosis and treatment option, in direct relation with the Apnea Hypopnea Index AHI. In East Europe the development of Sleep Medicine especially in the field of diagnosis and many treatment options, knows an important steps. Many Sleep Centers, are developed in last Years in Eastern Europe , because the pathology start to be very frequently. The Sleep Medicine starts to be very modern and known. The otorhinolaringologist, has an important role in the somnology Centers. He has a good collaboration with other specialities, and has the posiblitity to establishing the treatment possibilities, for a better quality of life in patients with Obstructive Sleep Apnea Syndrome, adults and children

SM-OD-10

Prevalence and associated factors to snoring in a Brazilian population

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The prevalence of snoring is quite variable. Studies describe the prevalence between 2 and 85% of the predominantly male population. However, the frequency, intensity, and presence of apnea make it difficult to define. The aim of this study is to estimate the prevalence of snoring in a sample of from Campinas City population, by gender, and analyze associated factors.

Method: It is a population-based, cross-sectional study, carried out with data from the Campinas Health Survey developed in 2014/2015. A total of 3021 participants: adolescents (n=1023), adults (n=1011) and elderly (n=987) participated in the study. Prevalence and confidence intervals for the dependent variable were estimated according to independent variables. Differences were tested by Chi-square test. Prevalence ratio was estimated by multiple Poisson regression, adjusting for gender and age. The analyses were stratified by gender and performed with svy commands of STATA 11.0.

Results: The prevalence of snoring in the survey was: 41%. Teenagers: 20% (men 24,3 % women 14,1%). Adults: 43 % (men 53,3 % women 43,3%). Elderly: 53% (men 56,8% women 50,8%)

For women (mean age 46,4 years old), there was significantly association with Hypertension (PR=1,3); Heart attack (PR=2,0), Cholesterol High Levels (PR=1,31); Dizziness (PR=1,6); Bad self-assessed health (PR=1,3); Witnessed apnea (PR=2,24) and Difficulty to maintain awake during the day (PR=1,14).

For men (mean age 43,3 years old), there was significantly association with Hypertension (PR=1,3); Cholesterol High Levels (PR=1,18); Witnessed apnea (PR=1,82) and Difficulty to maintain awake during the day (PR=1,12).

Conclusions: Snoring is a very common sleep complaint associated to the Obstructive Sleep Apnea Syndrome (OSAS). Hypertension and Cholesterol high levels are common comorbidities in adults (both gender). Heart attack, dizziness and bad self-assessed health were associated for women in this sample. Witnessed apnea and difficulty to maintain awake during the day were associated in this sample for adults (both gender).

SM-OPC-01

Analysis of PAT apnea-hypopnea index or PAT respiratory disturbance index in right and left lateral decubitus positions : What does it tell us?

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Purpose of the study

For the diagnosis of positional obstructive sleep apnea (OSA) syndrome, apnea-hypopnea index (AHI) in supine and non-supine position is an important sleep parameter. However, AHI in right and left positions are not importantly considered. The purpose of this study is to investigate the meaning of PAT apnea-hypopnea index (pAHI) and PAT respiratory disturbance index (pRDI) in right and left lateral decubitus positions (RLDP and LLDP).

Materials and methods used

We performed a retrospective study on 48 patients (M=44 F=4, Mean age 41.4 years, from 20 to 61 years) with OSA who underwent surgical intervention and had WATCH-PAT as a baseline evaluation of sleep apnea. 33 patients slept sufficiently in RLDP and LLDP to analyze sleep parameters. Physical examination and acoustic rhinometry were used for evaluating deviated septum of nose (DSN). Demographics, the presence of allergic rhinitis, and postoperative WATCH-PAT (if possible) were also analyzed.

Results

The patients with higher body mass index showed higher pRDI in the LLDP than RLDP. (p=0.014) Resistance difference between right and left nasal cavity obtained through acoustic rhinometry was associated with ratio of pRDI difference to total pRDI, but the other factors related to DSN did not have any association with other sleep parameters. The patients slept in lateral decubitus position more with less pRDI and pAHI. (p=0.013, 0.022)

Conclusion

From this study, DSN is not correlated with sleep apnea events in the RLDP and LLDP. This study suggests patients to strive to sleep in positions with less sleep apnea. Not only AHI or RDI in the supine and non-supine position, RLDP and LLDP have to be evaluated in the patients with positional OSA, its correlation with the sleep position percentage can be applicated to positional therapy

SM-OPC-02

Arterial dysfunction by oxidative stress in OSAS patients and the effect of nCPAP treatment.

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PURPOSE OF THE STUDY

Several studies suggest an increase of oxidative stress and a reduction of endothelial function in OSAS. We assessed the association between OSAS, endothelial dysfunction and oxidative stress. Further aim was to evaluate the effect of nasal continuous positive airway pressure (nCPAP) on oxidative stress and arterial dysfunction.

METHODS:

We studied 246 consecutive patients with heavy snoring and possible OSAS. Patients underwent unattended overnight home polysomnography. Ten patients with severe OSAS were revaluated after 6 months of nCPAP therapy. To assess oxidative stress in vivo, we measured urinary 8-iso-PGF2α and serum levels of soluble NOX2-derived peptide (sNOX2-dp). Serum levels of nitrite/nitrate (NOx) were also determined. Flow-mediated brachial artery dilation (FMD) was measured to asses endothelial function.

RESULTS:

Patients with severe OSAS had higher urinary 8-iso-PGF2α ($p<0.001$) and serum NOX2 and lower NOx. A negative association was observed between FMD and OSA severity. Apnea/hypopnea index was significantly correlated with the indices of central obesity and with urinary 8-isoprostanes ($r=0.298$, $p<0.001$). The metabolic syndrome ($t=-4.63$, $p<0.001$) and urinary 8-isoprostanes ($t=-2.02$, $p<0.05$) were the only independent predictors of FMD. After 6-months nCPAP treatment, a significant decrease of serum NOX2, ($p<0.005$) and urinary 8-iso-PGF2α ($p<0.01$) was observed, while serum NOx showed only a minor increase. A statistically significant increase of FMD was observed (from 3.6% to 7.0%).

CONCLUSIONS:

The results of our study indicate that patients with OSAS and cardiometabolic comorbidities have increased oxidative stress and arterial dysfunction that are partially reversed by nCPAP treatment.

SM-OPC-03

Comorbidities Associated with Obstructive Sleep Apnea: a Retrospective Study

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Introduction Obstructive sleep apnea (OSA) is characterized by partial or complete recurrent upper airway obstruction during sleep. OSA brings many adverse consequences, such as hypertension, obesity, diabetes mellitus, cardiac and encephalic alterations, behavioral, among others, resulting in a significant source of public health care by generating a high financial and social impact. The importance of this assessment proves to be useful, because the incidence of patients with comorbidities associated with AOS has been increasing consistently and presents significant influence in natural disease history.

Objective The objective of this study is to assess major comorbidities associated with obstructive sleep apnea (OSA) and prevalence in a group of patients diagnosed clinically and polysomnographically with OSA.

Methods This is a retrospective study of 100 charts from patients previously diagnosed with OSA in our service between October 2010 and January 2013.

Results We evaluated 100 patients with OSA (84 men and 16 women) with a mean age of 50.05 years (range 19–75 years). The prevalence of comorbidities were hypertension (39%), obesity (34%), depression (19%), gastroesophageal reflux disease (GERD) (18%), diabetes mellitus (15%), hypercholesterolemia (10%), asthma (4%), and no comorbidities (33%). Comorbidities occurred in 56.2% patients diagnosed with mild OSA, 67.6% with moderate OSA, and 70% of patients with severe OSA.

Conclusion According to the current literature data and the values obtained in our paper, we can correlate through expressive values obesity with OSA and their apnea hypopnea index (AHI) values. However, despite significant prevalence of OSA with other comorbidities, our study could not render expressive significance values able to justify their correlations.

Keywords: apnea, comorbidity, polysomnography, sleep

SM-OPC-04

Nasal mucociliary clearance in patients with obstructive sleep apnea syndrome

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Obstructive sleep apnea syndrome is characterized with periodic airway collapse leading to soft tissue traumatization, development of chronic inflammation and mucociliary clearance violation. Nowadays there are contradictory opinions on the role of mucociliary transport in nasal mucosa in patients with obstructive sleep apnea syndrome.

Aim of the study: to assess state of mucociliary transport in nasal mucosa in patients with obstructive sleep apnea syndrome of different severity.

Materials and methods

46 patients with snoring complaints were included in the study. All patients underwent polysomnography (Somnolab2, Weinmann, Germany) and saccharine test by Sacacura Y., 1983.

Results and discussion

Mild obstructive sleep apnea was diagnosed in 26.1% of patients, moderate – in 34.8% and severe apnea – in 39.1% of patients.

Saccharine time was increased in 21.3%, 33.1% and 94.3% of patients with mild, moderate and severe degree of obstructive sleep apnea, respectively.

Episodes of apnea, hypoxia and sympatovagal imbalance with local trophic disturbances lead to morphologic reorganization of ciliated epithelium accompanied with loss of ability to remove foreign bodies and microorganisms.

Conclusion

The increase of obstructive sleep apnea severity is accompanied with increased degree of mucociliary transport disturbance: patients with severe degree of obstructive sleep apnea showed the worst state of mucociliary transport, according to saccharine test.

SM-OPC-05

Relation between obstructive sleep apnea and hearing status - initial report.

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INTRODUCTION

Obstructive sleep apnea syndrome (OSAS) is a very common disorder in both male (24%) and female (9%) middle-aged adults population. OSAS incidence has been associated with obesity and upper airway obstruction and shown to contribute to several organ system dysfunctions, including hypertension, cardiovascular diseases, stroke, diabetes, and even sexual dysfunction. Recently, OSAS was also found to be associated with several ophthalmic manifestations, erectile dysfunction, nocturia, overactive bladder, and urgency incontinence.

So far, there are a very few studies trying , to investigate a possible relationship between OSAS and hearing impairment (HIL).

AIM

Aim of the study was to compare clinical data, polysomnography (PSG) and pure tone audiometry (PTA) results in patients with various OSAS degrees.

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Material and Methods

Fifty male patients with confirmed diagnosis of OSAS in various degrees of severity were enrolled to the study.

PSG , 7-day period of nocturnal auto-CPAP to establish therapeutic pressure, and PTA were performed in all subjects

Results

There were no statistically significant difference between analyzed groups according to age.

Authors detected no significant differences in analyzed frequencies of hearing among the groups

Conclusions

Our results did not detect any clinical significant hearing abnormalities according to OSAS severity.

Keywords OSAS, hearing impairment, PTA, auto-CPAP, AHI, male

SM-OPC-06

Sleep disorders are associated with poor health-related quality of life in adult and elderly population

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Objective: To evaluate the association between quality of life and sleep disorders, assessed by the high risk of apnea and daytime sleepiness questionnaires, in adults and the elderly population.

Methods: A cross-sectional population-based study enrolled a random sample of men and women, aged 18-90 years, living in Porto Alegre, southern Brazil. Participants were interviewed at home using standardize questionnaires, including the 12-item health survey (SF-12), Berlin (BQ), STOP-Bang (SBQ), and Epworth Sleepiness Scale (ESS). Participants underwent anthropometry to detect obesity (body mass index ≥30 kg/m2) and four blood pressure (BP) measurements to detect hypertension (≥140/90 mmHg or BP lowering medicine).

Results: Participants were 1259 adults and 599 elderlies aged 37.9 ±12.9 and 70.7 ±7.6, respectively. Among adults and elderly participants, most were women (56% and 69%, respectively), 19% and 30% had obesity and 26.2% and 70% had hypertension. The ESS average was similar among adults (7.6 ±5.2) and elderly (7.5 ±5.2), 25% and 46%, respectively, had high-risk of OSA according to the BQ, while 19% and 46% with the SBQ.

Among adult women, lower QoL (physical component) was associated with high ESS [50.1 vs. 51.7 P=0.03] and high-risk of OSA in both BQ [48.8 vs. 52.1; P <0.001] and SBQ [45.9 vs. 51.7 (; P <0.001]. Whereas among men the association was only present with high risk of OSA in the SBQ [50.8 vs. 52.9 (; P=0.01], independent of age, education, and smoking. High-risk of OSA in the BQ [43.9 vs. 48.6; P<0.001] and SBQ [40.6 vs. 48.1; P <0.001] was also associated with lower mental component of QoL, independent of age and smoking.

In the elderly women lower QoL (physical component) was associated with high-risk of OSA in the BQ [42.9 vs. 45.4; P=0.02] and SBQ [44.3 vs. 45.9; P<0.001], independent of age. In addition, mental component of QoL was associated with SBQ [48.1 vs. 51.4; P=0.009]. However, there was no association between QoL and sleep disorders among elderly men.

Conclusion: Sleep disorders are associated with poor health-related quality of life, mostly for the physical, but also for the mental component. Many age-related quality of life issues may be not the primary consequence of aging, but secondary to sleep disorders. Since sleep disordered breathing is highly prevalent in the elderly, screening for sleep apnea in clinical routine for this age group is even more justified.

SM-OPC-07

Symptoms of insomnia among patients with obstructive sleep apnea: A Cross Sectional Study

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Background: Obstructive sleep apnea (OSA) and insomnia, although considered opposing clinical conditions, are often found to co-exist among OSAS patients. The OSAs may paradoxically exacerbate co-existing insomnia and further deteriorate patients' general condition and comorbidities. However, causality between the two is considered controversial.

Objective: To assess the presence of insomnia among patients presented with obstructive sleep apnea in the O.S.A.S outpatient clinic

Methods: Cross sectional study. Data regarding sleeping habits and symptoms of insomnia, AHI, BMI, age of OSAS patients followed in the OSAS outpatient clinics between 2015-2016 in TASMC was collected from medical charts. Differences between apnea hypopnea index (AHI) scores were compared via T-test.

Results: The cohort included 283 patients, with male predominance (79.9%; n=226) mean age of 42.93±14.91 and mean BMI of 27.79±3.70. 34.92% (n=73) of patients presented with co-existing medical comorbidities, of which 53.42% (n=39) included essential hypertension. As for OSA assessment, mean AHI was 31.21±26.3 (n=209). Insomnic symptoms were reported in 36 patients (17.2%): Onset insomnia was reported in 25% of insomnic patients (n=9), maintenance insomnia was reported in 10 patients (27.7%); a combined disorder (onset insomnia with maintenance insomnia) was reported in 47.2% (n=17). There was no correlation between insomnia prevalence and AHI was detected and no unique sociodemographic or anamnestic characteristics were detected among the insomnic group, discriminating them from the non-insomnic OSAS patients.

Conclusion: Insomnia of sleep apnea patients should be regarded as a comorbidity, and might affect c-pap compliance and reduce patient satisfaction regarding surgical outcome. Insomnia-related symptoms should be noted at initial patient intake, and further addressed and followed along with OSA surgical treatment.

SM-OPC-08

The Relationship between Snoring Noise and Hearing Impairment in Snorers and Their Spouses

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Background and Objective : Snoring is a condition that affects a large percentage of the population and is associated with various medical and social complications. There are few published reports investigating the effects of chronic snoring exposure on the hearing. We examined whether there is an association between chronic snoring noise exposure and noise induced hearing impairment not only in snores but also in their spouses. Subjects and Method : Sixty snorers and 27 spouses under aged 55 years were recruited. All participants had more than 5 years of exposure to snoring. Questionnaire for snoring and pure tone audiometry were conducted. Subjects were classified into normal hearing group and hearing impairment group. Results : Forty percent of Snorers and 25.9% of spouses had hearing impairment. The snorers with hearing impairment had longer duration of snoring than the snorers with normal hearing. However, there were no statistical differences in loudness of snoring between the two groups. In spouses, there were statistical differences in loudness of exposed snoring and in duration of snoring exposure between the hearing impairment group and the normal hearing group. Conclusion : The result of this study indicated that chronic exposure to snoring noise may be associated with hearing impairment in snorers and their spouses. But in the snorers, further studies are required to identify the factors other than snoring noise that are associated with hearing impairment.

SM-OPC-09

Three dimensional analysis of patients with obstructive sleep apnea using cone beam computed tomography

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Aim: Our aim was to assess the role of craniofacial bones and soft tissues in obstructive sleep apnea (OSA) in relation to height, obesity, age and gender.

Materials and methods: From April 2014 to December 2014, 154 subjects with sleep complaints underwent a polysomnography and a craniofacial cone beam computed tomography (CBCT). Twenty-seven subjects had no significant OSA, as their AHI (apnea and hypopnea index) and ODI (oxygen desaturation index) were lower than 10/h. One hundred and seventy-seven patients suffered from OSA (AHI ≥ 10 and ODI ≥ 10). Craniofacial and upper airway structures were compared between OSA patients and normal subjects, and according to OSA severity within the cohort and between the two genders.

Results: OSA patients demonstrated a narrower maxillo-palatine core volume (11.7±3.2 vs 14.6±4.9cm3), even when adjusting for age, gender, height, neck circumference and body mass index. Soft tissues thickness was a marker for OSA severity. Maxillary and mandibular volumes were significantly smaller in severe cases for men only.

Conclusions: These upper airway measures provide a comprehensive analysis of bony structures and soft tissues, which can be involved in OSA. The maxillary bone volume was constantly tighter in the OSA group, while soft tissues were related to OSA severity. Severity factors were different between men and women.

SM-Ot-01

Relationship between GERD and sleep quality in patients with obstructive sleep apnea syndrome

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Purpose of the study was to assess the sleep quality in obstructive sleep apnea syndrome (OSAS) patients with gastroesophageal reflux disease (GERD) and to compare with the control group without GERD.

Materials and Methods: In this prospective clinical study data of 56 consecutive adult patients with firstly proven OSAS verified in overnight polysomnography at University hospital were analyzed. According to the reflux-related symptoms and findings patients were divided into two groups: OSAS GERD (N=38) and OSAS non-GERD (N=18) (control group). Groups were similar with regard to age, gender and body mass index (P>0.05).

Sleep quality was assessed subjectively and objectively. Subjectively sleep quality was self-rated by the patients using 100 mm visual analogue scale (“0” represents good sleep quality and “100” – extremely poor sleep quality). Also by calculating Pittsburgh sleep quality index (PSQI) (> 5 score shows poor sleep within the last month). Objectively sleep quality was assessed with polysomnography parameters evaluating sleep efficiency, arousal index and apnea–hypopnea index (AHI). GERD diagnosis was proven by the presence of reflux-related symptoms, signs and endoscopically defined erosive or histological esophagitis.

Results: GERD was diagnosed in 67.9% of OSAS patients. Subjectively poor sleep quality was self-rated more common in OSAS GERD group than in non-GERD group: 86.8% vs. 61.1%, respectively (P<0.05). Mean sleep quality score on 100 mm VAS was also significantly worse for OSAS GERD group in comparison to non-GERD group: 53.6 vs. 32.2 points, respectively (P<0.05). Moreover, according to PSQI, OSAS GERD group patients demonstrated poor sleep within the last month significantly more often (65.6%) than non-GERD group patients (37.5%) (P<0.05). Objectively two of three polysomnographic parameters, namely sleep efficiency and arousal index, were similar for both groups. However, AHI ≥15 episodes/hour was significantly more frequent in OSAS GERD group: 50.0% vs. 16.7%, respectively (P<0.05).

Conclusions: A high prevalence of GERD in OSAS patients was identified. The self-rated poor sleep quality was determined significantly more often in OSAS patients with GERD than in those without GERD. Worse sleep quality was significantly related to more severe OSAS. We are recommended an examination for GERD for patients with OSAS.

SM-Ot-02

Sexual and Urinary Health in OSA patients

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Quality assurance of OSA treatment can be evaluated by pre-treatment and post - treatment Sexual and Urinary Health evidence based quality of life instruments.

We used the SNORE 25, Pre and Post Treatment Polysomnograms, Sexual Health Inventory for Men (SHIM), American Urological Association Symptom Score (AUASS), the Female Sexual Function Index (FSFI), the Pelvic Organ Prolapse/ Urinary Incontinence Sexual Health Questionnaire (PISQ-IR), the Overactive Bladder Questionnaire (OAB-Q) these instruments to evaluate the Sexual and Urinary Health of the OSA patient before and after treatment with surgical and medical therapies.

Development of a program to do this in an online and digital format will be described. Results will be correlated with clinical and laboratory findings.

We will demonstrate an online evidence based validated questionnaire for use in Quality assurance and it placement an online HIPAA compliant foundation accessible via IOS or Android operating system.

Results tabulated at pre-op as well as 3, 6, and 12 months post op will be presented along with statistical significance. They will demonstrate the association of OSA to Sexual health as well as the effect that treatment has on sexual health at post op, 3, 6 and 12 months. The evidence based validated questionnaires can also be used to measure the effect of OSA and Abnormal sleep patterns on nocturia. Nocturia is commonly thought of as a symptom of Benign Prostatic Hypertrophy. We will demonstrate the potential of a second cause of nocturia, that being OSA and abnormal sleep patterns. In addition we evaluated the data from the REDUCE study of over 8,000 men relative to nocturia and sleep disorders. Improvement of their urinary health and reduction in bladder symtptoms was negatively correlated with sleep disorder.

SM-Ot-03

Sexual and Urologic Health in OSA Patients

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INTRODUCTION AND OBJECTIVES: OSA and other Sleep disorders have been known to be probable risk factors for sexual and urological health disorders. Through verified, evidence based QOL instruments we studied new patients and a large cohort of study patients to identify the correlation, relationship, and risk factors for sexual and urologic health in men and women with OSA and other Sleep Disorders.

Methods: The MOSSS-6 questionnaire (6 questions on sleep health/OSA) filled out by 6,915 men in the REDUCE study (2-4 year follow up of men treated for BPH with dutasteride) was used to evaluate abnormal sleep and possible OSA during and after treatment.

The SHIM (Sexual Health Inventory for Men) and AUASS (American Urinary Association Symptom Score) questionnaires in men and the FSFI (female sexual function) and OAB-q (Overactive Bladder Questionnaire – short form) in women, along with the SNORE-25 and ESSS were used to evaluate patients who had OSA and were seeking therapy. It was also used post therapy as a means to evaluate the efficacy of therapy. The severity of OSA (AHI, AI), OSA Symptoms, and BMI among other metrics were correlated with the QOL questionnaires.

Results and Conclusions: In the placebo arm of the REDUCE study, we found that the abnormal sleep problems associated with nocturia did not improve when the urinary symptoms were relieved, suggesting that a primary sleep disorder, and possible OSA, needs to be evaluated in these patients.

In this study, using the AUASS, SHIM, FSFI, OAB-q along with the SNORE 25 and ESS, we found and will demonstrate the risk factors for Sexual and Urological Health in OSA patients and the direct and variable relationship to AHI, AI, BMI, and OSA Sx.

SM-Ot-04

Sleep quality among health care workers

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Purpose of the study :

Sleep disorders and their impact are a topical issue. So health professionals are exposed to Burn out and sleep impairment.

Our goal is to study sleep disorders in healthcare workers and correlate it with quality of life.

Materials and methods :

This was a prospective study carried out at the ORL and CCF department of the Rabat Specialty Hospital. The quality of sleep was assessed by the Pittsburg Sleep Quality Index (PSQI) validated in its French version and using an EQ-5D validated in its Arabic version for Morocco.

Several variables were analyzed (age, sex, marital status, children, means of transport, description of sleep: hours of sleep, bedtime, time of day, nap, medication, sleep abnormalities). Thus the questionnaire was distributed to the staff of the different departments (medicine, surgery, radiology, laboratory, administration).

Results :

130 questionnaires were distributed, 120 questionnaires were recovered.

The mean age was 34 years (34.02 ± 9.61 years).

43.7% of our candidates had children.

37% of our population were doctors while 52% were nurses 3.4% of nurses and 7.6% were administrators.

Approximately 73.9% of participants did not report any history of use of sleep medications.

Regular consumption of alcohol was reported by 6/120 (5, 1%) participants while smoking was reported by 8/120 (6.8%) participants.

The duration of sleep of less than 7 hours was observed in 40% of the cases.

80% of the participants were good sleepers and had a PSQI score between 1 and 7.

30% of our population have a quality of life that is around 80% according to the EVA.

In a univariate analysis, the factors determining the function (p 0.02) and the nocturnal diet (p 0.02), the better the quality of sleep, the better the quality of life.

Conclusion :

Health professionals are a particularity in terms of sleep. Moreover, there is a close relationship between the quality of life and the quality of sleep.

Authors:

SEFRIOUI.T.I, Pr NITASSI.S, LACHHAB.O, Pr OUJILAL.A, Pr ESSAKALLI.L

SM-Ot-05

The Finite Element Simulation of the Upper Airway and the Acoustic Analysis of Snore Sounds of Patients with Obstructive Sleep Apnea Hypopnea Syndrome

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Purpose of the study: To investigate the snoring mechanism of patients with Obstructive Sleep Apnea Hypopnea Syndrome (OSAHS) and to identify the acoustic characters of OSAHS snore sounds from different obstructive sites.

Materials and methods used: A 3-dimensional (3D) finite element (FE) model was developed to simulate the realistic anatomical structures of the human upper airway. The inherent modal simulation and the fluid-structure interaction (FSI) method simulation were done to obtain the frequencies and the corresponding shapes of the soft tissue vibrations. Then 30 subjects with complaints of snoring were randomly selected from patients undergoing sleep studies. Snore sounds were acquired simultaneously by M50 with a sampling frequency range from 3 Hz to 50000 Hz. Snore samples were manually selected in Audacity V2.1.1. Discrete Fourier Transform (DFT) of all the snore samples were performed by MATLAB R2015b. All the spectrums were normalized to eliminate effects of recording devices and distance. Jitter%, shimmer%, spectrum convergence ratio (SCR) and correlation dimension analysis (D2) were calculated. Statistical analysis was performed by SPSS 17.0.

Results: The first 6 orders of modal vibration were obtained through the inherent modal simulation as 11.798Hz, 18.357Hz, 20.965Hz, 22.01Hz, 36.06Hz and 39.108Hz. Frequencies of mode 1, 2, 4, 5 were from tongue vibration. Frequencies of mode 3 and 6 were both from the soft palate vibration. Steady pressure distribution and air distribution line in the upper airway were shown clearly in the FSI simulation results. Spectrum collections of all the snore samples has no difference between upper and lower site origins. Shimmer% compared between upper and lower site snore sounds were different between each other. SCR and D2 of upper and lower site snore sounds has significant difference between each other.

Conclusion: The vibrations of soft tissue and the tissue-airflow interactions could be observed clearly by applying the finite element methods (FEM). Acoustic analysis of snore sounds below 40 Hz needed to be paid attention to. Snore sounds of OSAHS patients with Friedman classification of palate position III-IV and tonsil size I has nonlinear components. STFT and Chaos analysis could be an effective tool for acoustic analysis of snore sounds. Shimmer%, SCR and D2 may be useful parameters to help locate the obstructive sites.

SM-Ot-06

Weight Reduction to Improve OSA in Obese Patients, Trang Experience

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Purpose : to describe the results of weight reduction in obese patients with OSA in sleep clinic Trang hospital.

Materials and Methods : The adult OSA patients with obesity were enrolled after polysomnography. The patients was counseled to reduce the weight by modified Dukan diet, empowerment during the weight reduction period together with group therapy and role model. The weight, height and body mass index were recorded at the end of first week, 2, 4, 6, 9 and 12 months. Afer maintaining the body mass index for 6 months, the polysomnography was performed to determine whether OSA was improved. The descriptive statistics were used.

Results : Of 143 patients who underwent polysomnography in sleep clinic Trang hospital, 97 were OSA. Twelve patients were mild, 35 were moderate and 50 were severe. Only 49 patients needed CPAP with low predicted success rate of UPPP. Forty-one patients of 49 were obese. The mean age was 47.9 years (32-76). There were 30 male and 11 female. After modified Dukan diet was introduced, 32/41(78%) could reduce the body mass index more than 1 kg/m2. Ten patients have reached the goal of BMI less than 24.9 kg/m2 and have maintained the body weight. Out of 10 patients, 4(9.75%) have maintained the body weight with BMI<24.9 kg/m2 more than 6 months. All of 4 patients underwent polysomnography, the AHIs were <5/hr in all cases, and the CPAP was discontinued.

Conclusion : The obesity is one of the most component of OSA. The modified Dukan diet, patient empowerment with group therapy and role model can lead to significant weight reduction which improved OSA and could discontinued CPAP.

SM-Ot-07

Why you might consider prescribing Singing for Snorers to patients presenting with a chronic snoring problem or mild to moderate sleep apnoea.

A.Ojay*(1)

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Objective

To provide a rationale and evidence in support of the title, and to give delegates a personal experience of what a Singing for Snorers exercise feels like.

Author

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Symposium talk outline

What is Singing for Snorers?

A three-month programme of daily singing exercises, using sounds and tunes specifically created to tone and strengthen the pharyngeal muscles, providing a comprehensive workout for the muscles that help keep the airway open and unobstructed.

Rationale – With age we lose tone and strength in our muscles unless we exercise vigorously. For many people losing tone in their throat muscles is sufficient to leave their throat vulnerable to snoring and even sleep apnoea. Targeted singing exercises could provide a joyful and effective treatment.

Research to date

2000 pilot trial: 20 chronic snorers undertook a three-month daily singing exercise programme. Snoring on average reduced.

2013 Clinical RCT at Royal Devon & Exeter NHS Hospital. 127 subjects. Two wings: patients with simple snoring; patients with mild to moderate sleep apnoea. Those using the Singing for Snorers programme for three months showed a significant reduction in frequency of snoring and in daytime sleepiness.

Feedback

Over 7,000 people have tried Singing for Snorers.

Main feedback points (through email and feedback form): reduction in snoring frequency and volume; reduced sleepiness and partner-observed apnoeas (including case studies with polysomnographic support); a happier partner and 'feel good' factor from singing the exercises. No negative effects recorded.

Demonstration and delegate participation!

Alise teaches one exercise from Singing for Snorers so delegates can experience the action of the sounds and tune on their own throats. The selected exercise repetitively raises and lowers the soft palate.

Invitation for further research

Based on fifteen years of feedback and a clinical trial, I passionately believe Singing for Snorers is an effective treatment for suitable patients. So that more people can benefit from this intervention, an RCT needs to be carried out with before and after sleep studies, thereby providing medics, nurses and therapists with the clinical evidence to prescribe it with confidence.

Questions and answers

References

Pilot trial: http://www.ncbi.nlm.nih.gov/pubmed/11068344?dopt=Abstract

Clinical RCT: http://www.scirp.org/journal/PaperInformation.aspx?PaperID=31850

SM-RAS-01

Does Drug-induced Sleep Endoscopy Can Predict Success of TORS in OSA ?

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The first Transoral Robotic Surgery (TORS) for Obstructive Sleep Apnea-Hypopnea Syndrome (OSAHS) was carried out in May 2008.

After a few years, the technique was adopted with personal modifications in many ENT centers throughout the world.

Since 2008 till 2014, more than 100 cases were published in 7 single center reports in Literature.

In 2014, the first multicenter study about TORS in which a cohort of 243 cases from 7 groups in 5 different countries was available.

Today, TORS is included in the surgical routine for sleep disordered breathing (SDB) treatment in a great number of ENT departments. Although so far just few groups have series of more than 100 TORS cases, many other groups have completed more than 50 consecutive TORS for OSAHS.

It is probably one of the most published techniques in tongue base area, much more popular than the open TBRHE that inspired TORS.

According to the TORS multicenter study, 66.9% of the outcomes were successful, and 33.1% were unsuccessful with different degrees of severity. Collectively, average AHI was reduced from 43.21 ± 22.60 preoperatively to 17.54 ± 16.48 postoperatively.

Drug-induced sleep endoscopy (DISE) is a fiberoptic examination of the upper airways under proper sedation to determine the exact site of upper airways vibration / collapse in OSAHS patients. The review of sleep endoscopy findings in the literature reveals that tongue base hypertrophy is an obstructive condition in many, if not most of, OSAHS cases. Its prevalence is about 27.8% of all OSAHS cases studied by DISE i.e. more than one fourth of cases. So that it must be assessed before surgery and cannot be overlooked.

In this study, retrospective review of hospital records of patients suffering from moderate to severe OSAHS and had undergone TORS for management of tongue base hypertrophy has revealed success rate of only 66.9% (i.e. not 100%).

That was the motivation behind studying the findings of pre & post operative Drug-induced sleep endoscopy (DISE) in those patients to understand causes of failure and to achieve the best outcomes in patients where we had TORS surgical failures and to define the selection criteria for TORS with high postoperative success rate.

SM-RAS-02

Robotic tongue base surgery with Omni-guide fiber transmitted CO2 LAZER

M.Karaman*(1)

(1)İstanbul Medipol University, ENT Department, Turkey, , Turkey

The objective and content of my proposal: OSAS is a disease with multi-level obstructions. There are many diagnostic methods. The fact is that the level (velum, oropharynx, tongue base, epiglottis), type (circumferential, anteroposterior, lateral) and severity of collapse (partial, complete) could not always predict the outcome of upper airway surgery. Along with endoscopic findings, the predictive value of known polysomnographic and clinical variables (e.g., AHI, body mass index [BMI]) could not always predict the outcome of upper airway surgery in OSA patients.

Purpose of the Keynote lecture: There is a right direction of the chaos caused by the multiplicity of surgery procedures and inability of the ideal method. These realities are especially valid for the OSAS patient with retrolingual pathologies. Thus, we have some troubles in diagnosis and surgical treatment of OSAS. The purpose may be to inform the details especially on tongue base treatment (Robot assisted Surgery,) with the exposition of the video in keynote lecture. The objective is to compare intra-operative and post-operative effectiveness of fiber delivered CO2 laser to monopolar electrocautery in robot assisted tongue base surgery to show that the use of CO2 laser in robot assisted tongue base surgery has various intraoperative and post-operative advantages when compared to monopolar electrocautery.

Panelist's name: Prof. Dr. Murat KARAMAN;

Panelist's nationality: Turkey; İstanbul Medipol University, ENT Department.

Panelist's prefered topics: Keynote lecture with the exposition of the video about "Robotic tongue base surgery with Omni-guide fiber transmitted CO2 LAZER".

Themes of Sleep Medecine: Tongue Base Treatment; Robot assisted Surgery; Surgical Treatment of Snoring /OSAS.

SM-RAS-03

TORS for OSAHS; Does the End Justify the Means ?

A.Bahgat*(1)

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Tongue base hypertrophy is an obstructive condition in many, if not most of, cases of obstructive sleep apnea–hypopnea syndrome (OSAHS).

Base of tongue (BOT) is difficult to manage surgically, and its surgery remains a great challenge for both surgeon and patient.

Although minimally invasive techniques are not sufficient to satisfactorily manage these kinds of patients, Transoral robotic surgery (TORS) has proved to provide excellent and safe access to BOT and supraglottis while enabling the surgeon to maintain haemostasis.

In this study, TORS was compared retrospectively versus other surgical options for management of BOT hypertrophy in OSAHS patients.

These options include; Chabolle's operation (open transcervical Tongue Base Reduction and Hyo-epiglottoplasty "TBRHE", Maxillomandibular advancement "MMA", Genioglossus advancement "GGA", and Hyoid suspension "HS" operation (Thyrohyoidopexy)

In the same study, TORS was prospectively compared versus hypoglossal nerve stimulation surgery, other transoral BOT approaches (LASER and Coblation) and non-surgical measures e.g. CPAP and oral appliances.

In conclusion, TORS technique is relatively quick and safe, easy to learn and very effective in terms of cardiorespiratory and neuropsychological results, with very low morbidity and complication rates even without the need for preoperative tracheotomy. However, there's a common agreement now in OSA surgery, we don't have to search for "treatment of choice", instead, we have to choose and tailor the treatment options for each patient. Careful selection of candidates is required to obtain satisfactory results.

SM-RAS-04

TORS for OSAHS; Does the End Justify the Means ?

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Tongue base hypertrophy is an obstructive condition in many, if not most of, cases of obstructive sleep apnea–hypopnea syndrome (OSAHS).

Base of tongue (BOT) is difficult to manage surgically, and its surgery remains a great challenge for both surgeon and patient.

Although minimally invasive techniques are not sufficient to satisfactorily manage these kinds of patients, Transoral robotic surgery (TORS) has proved to provide excellent and safe access to BOT and supraglottis while enabling the surgeon to maintain haemostasis.

In this study, TORS was compared retrospectively versus other surgical options for management of BOT hypertrophy in OSAHS patients.

These options include; Chabolle's operation (open transcervical Tongue Base Reduction and Hyo-epiglottoplasty "TBRHE", Maxillomandibular advancement "MMA", Genioglossus advancement "GGA", and Hyoid suspension "HS" operation (Thyrohyoidopexy)

In the same study, TORS was prospectively compared versus hypoglossal nerve stimulation surgery, other transoral BOT approaches (LASER and Coblation) and non-surgical measures e.g. CPAP and oral appliances.

In conclusion, TORS technique is relatively quick and safe, easy to learn and very effective in terms of cardiorespiratory and neuropsychological results, with very low morbidity and complication rates even without the need for preoperative tracheotomy. However, there's a common agreement now in OSA surgery, we don't have to search for "treatment of choice", instead, we have to choose and tailor the treatment options for each patient. Careful selection of candidates is required to obtain satisfactory results.

SM-RAS-05

Trans oral robotic surgery for sleep apnea syndrom : interest of sleep endoscopy

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Le syndrome d'apnées obstructives du sommeil est une des pathologies du sommeil les plus fréquentes. Le traitement de référence de cette pathologie est la ventilation en pression positive continue qui réalise une véritable attelle pneumatique.

La chirurgie robotique de la base de langue dans le syndrome d'apnées obstructives du sommeil est une chirurgie récente .

Cette chirurgie ne peut être proposée que pour des patients présentant un syndrome d'apnée du sommeil sévère en échec de ventilation en pression positive continue. Les principales causes d'échec dans le syndrome d'apnées obstructives du sommei sont : des fuites au niveau du masque, des pressions trop fortes avec intolérance au niveau nasal, des effets indésirables a type d'aérophagie et une mauvaise acceptabilité par le patient et /ou son conjoint

La somnoendoscopie est un examen, effectué sous anesthésie générale durant lequel on réalise une nasofibroscpie chez un patient qui reste en ventilation spontanné. Le monitorage de la profondeur de l'anesthésie était réalisé à l'aide d'un index bispectral (BIS). Cet examen permet de localiser les différents sites obstructifs responsables du SAOS et de proposer un traitement ciblé, adapté à chaque patient.

L'endoscopie sous sommeil induit ou somnoendoscopie est un examen indispensable en préopératoire pour apprécier les différents sites obstructifs responsables de la pathologie obstructive du sommeil. Cet examen permet de sélectionner les patients qui répondront au mieux à la chirurgie robotique.

SM-SM-01

Home sleep testing: comparison between polysomnography type II and WatchPat®

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Introduction: International Classification of Sleep Disorders (ICSD 3-2014) for obstructive sleep apnea (OSA) diagnosis allows out-of-laboratory sleep testing (OCST). High prevalence of OSA and laboratorial polysomnography (PSG) costs - gold standard - require new reliable technologies for domiciliary OSAs diagnose and follow-up.

Methods: Twenty-six patients were submitted simultanesoly type 2 home polysomnography - Alice PDx® (Philips, The Netherlands) and WatchPAT® (WP) - Itamar Medical, Israel. PSG was scored by the rules of the American Academy of Sleep Medicine (V2.2 manual version). WatchPat® has its own automatic program for analysis. Sleep efficiency, sleep architecture, apnea-hypopnea index (AHI) and oxygen saturation were compared.

Results: The mean sleep efficiency was 79.87% to PSG and 80.11% to WP (p 0.63). The mean sleep latency was 36.95 minutes to PSG and 40.08 to WP (p 0.59), REM sleep latency was 154.5 minutes to PSG and 120.41 to WP (p 0.07). The sleep architecture: REM, superficial (N1 / N2) and deep (N3) respectively, 13.67, 72.18 and 5.44 to PSG and 19.84, 61.95 and 18.19 to WP (p 0.0057, 0.0123 and <0.0001, respectively). Apnea-hypopnea index (AHI) was 16.35 events/hour for PSG and 25.43 for WP (p 0.001). Mean oxygen saturation and its nadir, respectively, 93.81% and 86.35% to WP and 94.4% and 83.58% to PSG (p 0.007 and <0.0001). The Intraclass correlation coefficient presents 0.886 to AHI, 0.942 to oxygen saturation, 0.757 to sleep latency.

Conclusion: WatchPat® has good correlation compared to type 2 PSG mainly to AHI and saturation data.

SM-SM-02

The correlation between sleep structure and severity of Obstructive sleep apnea based on Watch-PAT200®

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Introduction) Recently, many portable devices have been developed as an alternative to full PSG for the diagnosis of OSA. Watch-PAT 200 detect OSA severity parameters, such as apnea hypopnea index (AHI), respiratory disturbance inghdex (RDI), and oxygen desaturation index (ODI) using Peripheral Arterial Tone(PAT) signals. The aim of this study was to evaluate the correlation between severity of OSA and sleep structure using a Watch-PAT 200.

Materials and methods) A total 921 patients who underwent a home-based portable sleep study using Watch-PAT 200 for obstructive sleep apnea (OSA) from March 2011 to July 2016 were included in this study. Subjects were classified into 4 groups according to the pAHI and pRDI ; no OSA (PAT apnea hypopnea index [pAHI], PAT respiratory disturbance index [pRDI] < 5/hour), mild OSA (5≤ pAHI, pRDI <15/hour), moderate OSA (15 ≤ pAHI, pRDI < 30/hour), or severe OSA groups (pAHI, pRDI ≥ 30/hour). Parameter of sleep structure was % of deep sleep, % of light sleep, % of REM sleep in watch-PAT data. Correlation and agreement between the OSA severity parameter (pRDI, pAHI) and sleep structure (%of deep sleep, % of light sleep, % of REM sleep) in watch-PAT data were assessed by one way ANOVA

Result) % of light sleep show a progressive increase with increasing severity of OSA. % of Deep Sleep and % of REM sleep show a progressive decrease with increasing severity of OSA.

Conclusion) This study revealed that the respiratory parameter such as pAHI, pRDI on sleep apnea show significant correlation with parameter of sleep structure such as % of light sleep, % of Deep Sleep and % of REM Sleep.

SM-SM-03

The Effect of Trigeminal Olfaction on the Respiratory Pattern of OSAS

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Key words: olfaction, obstructive sleep apnea, trigeminal olfaction

Purpose: The standard treatments of obstructive sleep apnea include upper airway surgery and cPAP. The complication and risk of surgery are concerned by patients. The poor compliance of cPAP is usually common. Another option of treatment is researched persistently. Stimulation of trigeminal olfaction could strength lateral pharyngeal wall of upper airway. OSAS is the collapse of upper airway in sleep. Aromatherapy may be the key to improved or resolve obstructive apnea syndrome or change sleep structure.

Methods:

We used essential oil extracted from Phalaenopsis Bellina as aromatherapy. Participants received polysomnography without aromatherapy as control group. On the other day, they receive polypsomnography with aromatherapy as intervention group. We analyzed the result of polysomnography and blood test before and after aromatherapy.

Results:

From 2016/2 to 2017/1, 14 participants joined the study. 11 people have OSAS and 3 people have no OSAS. Increasing of REM, sleep efficiency and Mean SaO2 were noted after aromatherapy with statistical significance. In OSAS group, AHI was increasing but there was no statistically significant.

Conclusion:

Essential oil extracted from Phalaenopsis Bellina as aromatherapy for treatment of OSAS lack evidence of improvement of AHI. Improved sleep efficiency and elevated Mean SaO2 may be considered as adjuvant therapy for OSAS. Normalization of REM may be the option of treatment for insomnia.

SM-SP-02

The effect of vitamin C to the rate levels of lipid per-oxidation, clinical symptoms and quality of life of patients with chronic tonsillitis

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ABSTRACT

Background: Health problems related to chronic tonsillitis are often found in children. Feelings of fatigue and lethargy, difficulty concentrating, discomfort in the throat, difficulty/pain of swallowing, halitosis is some clinical symptoms are often found in chronic tonsillitis. This clinical symptoms gives negative impact in daily and school activity that decrease quality of life. Influence of viral or bacterial invasion, oesophageal reflux, immune modulatory and free radicals play role in chronic tonsillitis. Free radicals are unstable molecules and highly reactive so that it can cause tissue damage, especially at the cell membrane. Potential damage caused by free radicals is limited by an antioxidants. Vitamin C is an antioxidant that easily donate electrons to break the chain reaction of lipid per-oxidation.

Objective: To prove vitamin C decrease the rate levels lipid per-oxidation, improve clinical symptoms and quality of life of chronic tonsillitis patients.

Material and Methods: Randomised controlled trial by simple random sampling. Inclusion criteria were male or female aged 5-18 years old patients with a diagnosis of chronic tonsillitis, normal nutritional status, the parents and patients willing to participate in research and sign an informed consent. Exclusion criteria were suffering from other chronic diseases such as chronic rhinosinusitis, chronic suppurative otitis media, chronic laryngitis, chronic gastritis, systemic diseases such as tuberculosis, diabetes mellitus, heart disease, kidney disease. Drop-out criteria was decided to stop following the study, acute exacerbations, and there are occur the side effects after administration of vitamin C. Rate levels of lipid per-oxidation, clinical symptoms and quality of life before and after administration of vitamin C.

Results: Total 51 patients, 10 dropped out and 41 were analysed. Lipid per-oxidation levels of vitamin C group post-intervension (3,41 (0,53 to 4,65)) no significant difference between pre-intervension (3,43 (0,39-4,16)) (p = 0,237). Total score of clinical symptoms of vitamin C group post-intervension (14,76 ± 4,34) was lower than the pre-intervension (20,38 ± 5,25) (p = 0,000). The total score quality of life of vitamin C group post-intervension (65 (52-79)) is lower than the pre-intervension (78 (57-88)) (p = 0,000). No side effects were reported after administration of vitamin C during research.

Conclusion: The level of lipid per-oxidation were given vitamin C no significant difference between without given vitamin C (p = 0,237). Clinical symptoms and quality of life were given vitamin C is better than without given vitamin C.

Keywords: chronic tonsillitis, levels of lipid per-oxidation, clinical symptoms, quality of life

SM-SPT-01

Demographic factors Affecting the responsiveness to Prone Positional Therapy for Obstructive Sleep Apnea

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Abstract

Purpose of the Study:

Previous studies have acknowledged the advantageous effect of the prone positional therapy for treatment of patients with obstructive sleep apnea (OSA) The aim of the present study was to study different factors that may affect the responsiveness to prone positional therapy in order to identify the subgroups that benefit from this treatment modality.

Materials and Methods used:

Forty patients, eight women and 32 men, with mild to severe OSA with an apnea-hypopnea index (AHI) of 23 (min: 5, max 65) with a mean age of 52 years (min:31, max:72), with a Body Mass Index (BMI) of 27 (min: 21, max:36) were included at the Department of Otorhinolaryngology of the Sahlgrenska University Hospital, Gothenburg, Sweden. On the first night the subjects slept in a normal bed and with optional sleeping position. The second night was after four weeks of adaptation to a new mattress and a pillow (restme®, Rest-Me Ab, Sweden) facilitating prone positioning during sleep. Two polygraphic (PG) sleep recordings were performed.

Results:

According to the first-night PG night twenty-seven patients had positional obstructive sleep apnea (POSA) The mean of all sleep time do not change significantly (p=0.9). The mean of total AHI and ODI were reduced from 25,95 to 10,52 (p<0,05) and from 22,02 to 9,5 (p<0,05) with treatment. AHi and ODI were imporved in almost all patients. However patients with POSA showed greater sensitivity to prone positional treatment than non-POSA patients (p<0.05). The response rate in men was significantly better than in women (p<0.05). Patients older than 66 years showed seemed to be less benefited by this therapy (p=0,048). BMI had no influence on the treatment effect (p<0.05)

Conclusion:

Most OSA patients seem to respond to prone positional therapy independent of age, gender, body mass index (BMI) and POSA. However the effect is greater in masculine POSA patients younger than 60 years.

Authors:

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SM-SPT-02

The effect of REM and non-REM Sleep versus Sleep Position on the Severity of Obstructive Sleep Apnoea RAQUEL ALVES1, PEDRO REBOREDO1, HELDER LOUSADA1, ARMIN BIDARIAN-MONIRI1-3 1Regenerative Medicine Program, Department of Biomedical Sciences and Medici

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Purpose of the study: The deleterious effect of the supine posture and rapid eye moment (REM) sleep on the severity of obstructive sleep apnoea (OSA) has previously been reported, nonetheless few studies have correlated the sleep stage to the body position including the prone sleep position.

The aim of the present study was to observe the effect of REM vs Non-REM sleep in the different sleep positions in order to evaluate whether it is the sleep position or the sleep stage that is the most important factor for airway collapse in OSA patients.

Material and Methods: Fifteen patients with mild to severe OSA enrolled in the study and performed two polysomnography (PSG) studies. First night was on a normal mattress and the second after four weeks of adaptation to a new mattress and pillow (restme®, Rest-Me AB, Sweden) facilitating prone positioning of the body and head during sleep.

Results: The total sleep time, wake after sleep onset, sleep efficiency and the proportion of REM, non-REM sleep did not alter significantly between the two PSG nights (p>0,005). The mean time spent in the supine and lateral positions decreased with and increase in the prone time during the second night with the new mattress and pillow (p<0,005). Mean AHI and ODI decreased from 15 to 5, and from 17 to 4 (p0,005).

Conclusion: After correcting for the sleep position no significant alterations in AHI were observed comparing REM and non-REM sleep stage in OSA patients. Sleep position seems to be the most important factor determining the airway patency in OSA patient. The respiratory parameters are deteriorated in the supine position with improvement in the lateral and nearly normalisation in the prone position independent of the sleep stage.

Keywords: Obstructive sleep apnoeal, REM sleep, Non-REM sleep, supine, lateral, prone position

SM-SPT-03

The Effect of Prone Positioning on Obstructive Sleep Apnoea

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Purpose of the study

The severity of obstructive sleep apnoea (OSA) is in most patients influenced by the body position. Previous studies have emphasised the importance of avoiding the supine position, however few studies have observed the effect of prone positioning on OSA. The purpose of the present study was to evaluate the effect of prone positioning on the respiratory parameters in OSA patients.

Materials and methods used

A new mattress and pillow set (restme®, Rest-Me AB, Sweden) was developed and tested at the Sahlgrenska University Hospital in Gothenburg, Sweden. The set is positioned on a normal bed and allows for comfortable prone and lateral positioning of the head and body with well-aerated space for breathing during sleep.

Forty-two patients (34 men, eight women) with mild to severe OSA, with a mean Apnoea-Hypopnoea Index (AHI) of 26 (min:6;max:93) and mean Oxygen Desaturation Index (ODI) of 22 (min:6;max:87) were studied regardless of position dependency. Two polysomnography (PSG) studies were performed. The first night was without treatment and the second night was with the mattress and pillow for prone or lateral positioning.

Results

The mean total sleep time was 399 minutes without and 378 minutes with treatment (P=0.7). The mean time spent in the supine position was reduced from 147 to 3 min ($p<0.001$) and the mean prone time increased from 13 to 274 min ($p< 0.001$) with treatment. The mean AHI and ODI for the whole night decreased from 26 and 22 to 12 and 10 respectively ($p< 0.001$) with mattress and pillow. AHI was 36 in the supine, 16 in the lateral and six in the prone position.

Conclusions

Lateral positioning may improve AHI and ODI in some OSA patients as compared to the supine sleep position. However prone positioning seems to normalise the respiratory parameters in most OSA patients regardless of severity of disease.

SM-SPT-04

The effect of the Prone Head Position on Respiratory Parameters in Obstructive Sleep Apnoea

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Objective: The severity of obstructive sleep apnoea (OSA) is dependent on the position of the head and body. Few studies have evaluated the effect of a true prone head position on the severity of disease in OSA. The objective of the present study was to evaluate the effect of the prone head position compared to the supine and lateral positions on the respiratory events in OSA patients.

Material and Methods: Fourteen voluntary patients, 13 men and 1 woman, with mild to severe OSA with a mean Apnoea/Hypopnoea Index (AHI) of 28 (min: 13, max 65) with a mean age of 51 years (min: 34, max 69) and mean BMI of 29 (min 23, max 35) were recruited at the Department of Otorhinolaryngology, Sahlgrenska University Hospital in Gothenburg, Sweden.

This was a two-night study with Polygraphic sleep recordings. The position of the body and the head were monitored by a body sensor and camera recordings. On the first night patients slept on a normal mattress and during the second night they slept on a mattress and pillow (restme®-Rest-Me AB, Sweden) facilitating prone positioning of the head with the nose mostly perpendicular to the underlying bed.

Results: The mean total sleep time did not alter significantly with or without the new mattress and pillow ($p=0.55$). The mean time spent in the supine and lateral positions were significantly reduced with an increased in the prone time during the second night ($p<0.001$). The mean AHI decreased from 28 to 12 ($p<0,001$) and the mean oxygen desaturation index (ODI) decreased from 22 to 12 ($p<0,005$) with the mattress and pillow. The AHI was 42 in the supine, 15 in the lateral and 11 in the prone position. The prone body position was divided into two subgroups with the head either aligned or nonaligned with the rest of the body. The mean AHI in the prone position was altered from 20 to 7 ($p<0.05$) with the alignment of the head only achieved by the new mattress and pillow.

Conclusion: Prone positioning during sleep seems to reduce the tendency of airway collapse in OSA patients. The alignment of the head with the body in the prone position with the new mattress and pillow nearly normalizes the breathing parameters independent of severity of disease.

SM-STS-01

Adult obstructive sleep apnea syndrome and tonsil hypertrophy: should soft palate surgery be associated with tonsillectomy?

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Purpose – Velopharyngoplasty and palatine tonsillectomy are at the very heart of surgical obstructive sleep apnea syndrome (OSAS) care. In case of clinically major tonsil hypertrophy, we evaluated the relevance of associating soft palate surgery to palatine tonsillectomy.

Methods – We conducted a retrospective single-center study in OSAS patients with a grade III/IV tonsillar hypertrophy treated by tonsillectomy. Preoperative assessment included an awake upper airway examination and a polysomnography test in all of them. The evaluation did not take sleep endoscopy results into account. Surgical efficacy was assessed on postoperative polysomnography using Sher's criteria: success was considered when postoperative apnea-hypopnea index (AHI) was less than 20/hr with a 50% reduction. Patients were considered as cured with a postoperative AHI less than 10/hr. In case of preoperative AHI ranging between 5 and 10/hr, patients were excluded from cure rate calculation. We compared palatine tonsillectomy efficacy alone, group A, and associated with soft palate surgery, group B.

Results – We analyzed 31 patients who had undergone surgery from December 2006 to March 2016. Their preoperative mean BMI and mean AHI respectively were 27.7 kg/m2 and 36.6 events/hr. The two groups (A, n=15 and B, n=16) were clinically comparable. In group A, success rate was 73.3% and cure rate was 69.2%. In group B, success rate was 62.5% and cure rate was 31.3%. There was no statistically significant difference between the two groups. In group A, a postoperative bleeding needed a reintervention. In group B, no complication was reported.

Conclusion – In case of major tonsillar hypertrophy, simultaneous soft palate surgery had no significant impact on success and cure rates. Although our series is limited in size, to associate soft palate surgery to palatine tonsillectomy does not seem required to increase success rates. Tonsillectomy should be practiced alone as soft palate surgery may increase the risk of nasopharyngeal stenosis or velopharyngeal insufficiency.

SM-STS-02

Advances and Challenges in Treatment of Obstructive Sleep Apnea: Experience in the United States and in France

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Obstructive Sleep Apnea (OSA) is one of the most prevalent disorders in adults. Undiagnosed and untreated OSA is associated with high healthcare costs. Multiple OSA related health risks have been recognized, emphasizing the importance of diagnosis and treatment of the affected patients. The gold standard for the treatment of OSA is continuous positive airway pressure (CPAP); however, compliance with CPAP treatment is low. Airway obstruction often occurs at multiple levels and pathophysiology is still poorly understood. Patients often look for alternative to CPAP treatments.

Proper patient evaluation and individualized medical and surgical treatment are important in order to achieve optimal OSA treatment results. The goal of this French-American roundtable discussion is to share experience with treatment of OSA in the United States and in France. The discussion will focus on comparing standard of care, current recommendations, treatment coverage, challenges and limitations that physicians face in the two countries. It will address access to innovative techniques, advances in surgical treatment and patient evaluation strategies that would help guide sleep physicians and surgeons in their decision process. Patient cases will be presented and discussed to illustrate the subject matter.

Panelists:

Maria Suurna, MD (USA) moderator; Ryan Soose, MD (USA); Mark D'Agostino, MD (USA); Robson Capasso, MD (USA); Marc Blumen, MD (France); Pierre-Jean Monteyrol, MD (France)

SM-STS-03

BARBED SLEEP APNEA SURGERY (BSS): A MODULAR APPROACH FOR THE TREATMENT OF RETROPALATAL OSAS

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Purpose of the study

To evaluate the tolerability and effectiveness of the Barbed Sleep-apnea Surgery (BSS), a modular approach for the surgical treatment of the retropalatal obstruction in patients with obstructive sleep-apnea syndrome (OSAS). The BSS includes a series of non-resective tissue-modeling surgical procedures, each addressing a specific retropalatal collapse pattern. Through the use of the barbed sutures, functional tenso-structural modifications of the fibro-muscular tissues inside the soft palate and the lateral pharyngeal walls are realized with the aim to reduce the collapsibility of the retropalatal space.

Materials and methods used

A pilot longitudinal study of consecutive adult outpatients with OSAS due to retropalatal obstruction (documented by means of DISE), who had formerly undergone tonsillectomy and refused CPAP, was conducted between November 2012 and June 2015. The patients respectively underwent to: Barbed Anterior Pharyngoplasty (BAPh) in case of antero-posterior collapse; Barbed Roman Blinds Technique (BRBT) in case of trasverse collapse; Alianza procedure (BRBT + BAPh) in case of circular collapse. The pre- and post-operative assessments of the polysomnographic and Epworth Sleepiness Scale (ESS) scores were analyzed.

Results

The results obtained in 60 patients (46 men; 76.6 %), with a mean age of 45.5 ± 8.7 years, were included in the analysis. The BRBT procedure was realized in 32 cases, Alianza in 20 cases, BAPh in 8 cases. The mean pre- and postoperative AHI values were, respectively, 29.3± 5/hour and 10.9 ± 6.5/hour (P < 0.001); and there was also a significant postoperative reduction in the mean time with < 90 % O2 saturation and ESS scores (P < 0.001). The mean postoperative hospital stay was 1.5 ± 0.5 days, and all of the patients started a soft oral diet on the first postoperative day; there were no significant complications and the mean tolerability VAS score was 4.5 ± 0.8. A successful outcome (defined as a post- operative reduction in the AHI of ≥50 % and/or a post- operative AHI of <20/hour) was obtained in 51 patients (85%).

Conclusion

The BSS represents an effective, non-resective, well-tolerated and repeatable procedure to relieve OSAS. The main advantages offered over other traditional surgical techniques are: soft tissues stiffening by means of stable tissutal scarring; the facility to address all the DISE retropalatal patterns; the muscles preservation. The BSS should be considered as a part of the multilevel surgical management of OSAS patients, as it can be easily associated to any nasal and/or tongue-base surgery.

SM-STS-04

Coblator Assisted Uvolopalatoplasty(CAUP)- Is its clinical efficacy affected by being overweight or mild OSA?

S.Lock*(1), Y.Chong(2)

(1)Tan Tock Seng Hospital, Singapore, Singapore, Singapore, (2)Tan Tock Seng Hospital Singapore, Singapore, Singapore

Coblation Assisted Upper Airway Procedure – Is its clinical efficacy affected by being overweight or mild OSA?

Paul LOCK1, Yaw Khian CHONG1

1 Department of Otorhinolaryngology, Tan Tock Seng Hospital, Singapore

Objectives: Coblator Assisted Upper Airway Procedure (CAUP) is a form of surgery for the treatment of snoring. We seek to understand if mild OSA or being overweight will affect the functional outcomes in terms of reduction in snoring levels post operatively.

Materials & methods: Patients who underwent CAUP in Tan Tock Seng Hospital, a tertiary hospital in Singapore over the course of a year were recruited. Patients underwent CAUP, comprising coblation channelling to the soft palate and uvulopalatoplasty, performed by one surgeon (CYK). Patients with apnea-hyponea index (AHI)>15, BMI≥30kg/m2, patients undergoing concomitant procedures and history of previous palate surgery were excluded from this study. Basic biodata was obtained, including BMI, Age, AHI. Snoring severity rated by their partners on a snoring scale were recorded pre and 4 months post surgery. Results were statistically analysed via SPSS 22.

Results: We achieved a response rate of 91% and sample size of 30 patients. 8 patients had AHI < 5 and 22 patients had AHI between 5-15. 13 patients were overweight (BMI 25-30) and 17 patients were in the normal weight category. Mean snoring scale was reduced from 7.55±1.65 to 3.35±2.29 ($p<0.001$) after the operation for group as a whole. Snoring decreased from 7.88±1.09 to 3.38±2.31, from 7.43±1.81 to 3.34±2.34, from 7.68±1.58 to 3.56±2.61 from 7.39±1.78 to 3.08±1.87 in the Non OSA, Mild OSA, healthy weight and overweight groups respectively ($p<0.05$ for all). Further analysis with Mann Whitney U test showed no difference in reduction in snoring between the groups.

Conclusion: CAUP leads to a significant and clinically relevant reduction in snoring in patients who have AHI<15 and BMI <30. Results were not affected by whether the patient was overweight (BMI 25-30) or had mild OSA (AHI 5-15). As such CAUP can be proposed as a form of treatment for snoring even for patients with mild OSA or are overweight.

SM-STS-05

Comparative retrospective analisys of three different surgical tecnique with and without barbed suture

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The purpose of this retrospective study is to compare the results obtained on three groups of patients treated with three different surgical techniques of palate-pharyngeal surgery. All patients were suffering with either severe or moderate OSAHS and CPAP was alreay excluded fron the therapuetical strategy for differt reasons.

In the context of each group the results are even compared in patients with same OSAHS parameters in which the only variable was the use or not of the barbed sutures.

All patients underwent preoperative sleep endoscopy to determine the the surgical procedure to be applied. The pattern of the collapse observed was either circular, antero-posterior or lateral, without hypopharyng and epiglottis involvement. The different patterns determined the surgical choices.

In the first group 22 patients treated with exclusive anterior palatoplasty were included; the AHI was between 18 and 27, minimal oxygen desaturation (Nadir) between 86% and 91%, ESS> 12.

In the second group we included 18 patients treated with esclusive lateral pharyngoplasty. OSAHS parameters were AHI between 26 and 38, minimal oxygen desaturation (Nadir) between 84% and 89%, ESS> 12.

The third gorup included 14 patients where the treatment of choice was the association of the two operations above. OSAHS parameters were AHI between 28 and 42, minimal oxygen desaturation (Nadir) between 86% and 91%, ESS> 12.

In the 50% of the patients of each group a vycril suture was classically used; in the left patients a Barbed Suture was chosen.

To compare the differences between this two subgroup the evaluation parameter chosen where the pain visual scale recorded over ten days, the healing time and the time restauration for a normal feeding.

All the techniques adopted gave satisfactory success rates independently to the kind of sutures used; Barbed suture group of patient showed a better compliance in the immediate postoperative period with a pain reduction in comparison with the other groups and a faster feeding restoration.

SM-STS-06

Efficacy of SKUP3 RCT on Blood Pressure after Modified UPPP

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Objectives: Obstructive sleep apnea (OSA) is an independent risk factor for hypertension. The SKUP3 study showed that modified uvulopalatopharyngoplasty (UPPP) significantly improved nocturnal respiration, sleepiness and quality of life. In this continuous study, the impact of surgery on blood pressure (BP) in patients with OSA was evaluated.

Methods: A single center RCT, comparing modified UPPP with controls at baseline and after 6 months. The controls received delayed surgery with an additional 6-month follow-up. All operated patients also had a follow-up after 24 months. Polysomnography (PSG) was performed at each follow-up. Systolic and diastolic BP (SBP, DBP) were measured the morning after PSG.

Results: 65 patients were included and randomized to intervention (n=32) or controls (n=33). The RCT showed significant differences between the groups at the follow-up (n=61/65, 94%) in both mean SBP (-9.4 mmHg, 95% CI 0.83-17.9, p<0.05) and DBP (-6.4 mmHg, 0.04-12.8, p<0.05), in favor of UPPP. The analyses of all operated patients showed a significant decrease in mean (SD) BP after 6 months (n=49/65, 75%), SBP -4.5 (9.0), p=0.001 and DBP -2.2 (6.6), p=0.030, as well as after 24 months (n=35/65, 54%), SBP -8.9 (11.5), p<0.0001 and DBP -4.2 (9.4), p=0.012. The BMI was unchanged.

Conclusion: The RCT showed that the blood pressure was significantly reduced after modified UPPP compared to controls, in a small selected group of patients with moderate to severe OSA. The long-term effect also showed significant effect, however, the results after 24 months are more uncertain due to a high rate of missing values.

SM-STS-07

ENDOSCOPIC COBLATOR-ASSISTED EPIGLOTTOPLASTY IN OSAS PATIENTS

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Purpose of the study: The Obstructive sleep apnea syndrome is a complex nosological entity characterized by an obstruction at various levels of the upper airways during sleep. One of the site which can create an obstruction during sleep is the hypopharynx which includes the tongue base and the epiglottis. The surgery at this level aims at widening the retro-lingual space of the airway.

The purpose of our study is to describe a new epiglottoplasty technique executed via transoral endoscopy by means of Coblation technology®

Materials and methods: Three patients have been assessed with OSAS diagnosis at Foggia University Hospital – ENT Department – Foggia - Italy. All the patients had undergone a sleep endoscopy which showed a retro lingual collapse caused by a primary epiglottis collapse.

Patients subsequently underwent endoscopic epiglottoplasty with Coblator, in conjunction with anterior pharyngoplasty in one patient and sphincter expansion pharyngoplasty in another.

Results: At 15-day follow-up only a fibrin streak was observed on the posterior face of the epiglottis. At 2-month follow-up no fibrin trace was detectable and the epiglottis looked the same shape as an healthy one, but smaller. The use of suture to approach the epiglottis mucosa appeared to be complex, with surgery time prolongation and without any advantages in the postoperative period, as the resulting scar looked the same.

The polysomnography exam after three months highlighted an AHI < 5 in all cases with ODI < 10 and 97% mean SO2, and 94% mean Nadir.

Patients reported a restful sleep with significant snore reduction. Only in one case did an annoying sensation of foreign body persist 6 months after surgery. Nevertheless this perception might be associated with the anterior pharyngoplasty which the patient simultaneously underwent.

Conclusion: the Coblator-assisted endoscopic epiglottoplasty may represent an excellent option for epiglottis surgery in OSAS patients, being less invasive and less expensive compared with techniques currently in use.

Michele Cassano- Assistant Professor of Otorhinolaryngology – University of Foggia - Italy

SM-STS-08

evaluation and management of obstructive sleep apnea by polysomnography and z-pharyngoplasty

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Obstructive sleep apnoea(OSA) has been observed since ancient times, and there are records of its symptoms,such as heavy snoring dating back over 2000 years.over the years our knowledge of sleep disorders has evolved to such an extent that the field is now a recognized speciality in medicine and otorhinolaryngology. The medical consquences how increased prevalence of coronary heart disease, heart failure and stroke.Various surgical procedures are now available to increase the posterior airspace and treat OSA in CPAP intolerant patients.however, no surgical treatment is 100% effective.

My study was done in teritary ent referral hospital which was 40 years purely doing ENT work.data was collected from inpatients who underwent surgery for snoring in our hospital, male population,mixed urban and rural areas, only in adults.sample size and technique by taking detailed clinical history, examination, Epworth sleepiness score questionare and performing sleep study before and after surgery.

My inclusion criteria are documented failure attempts of conservative measures, friedmann osa stages ii and iii, appearence of obstruction at level of softpalate contributing to OSAHS

My aim to evaluate the effectiveness of sleep study in diagnosing patients with OSA, to assess the role and indications of z-pharyngoplasty in treatment of peripheral type, to assess the postoperative status of patient undergoing this procedure.

SM-STS-10

Indications and outcomes of Functional Expansive Pharyngoplasty (FEP) for treatment of Obstructive Sleep Apnea Syndrome in adults: our experience.

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Purpose of the study

The introduction of DISE in the diagnostic work-up for OSA patients has allowed a better indentification of site and pattern of airway obstruction, revealing the central role of pharyngeal walls' lateral collapse. This finding has led to an evolution in pharyngeal surgical techniques, shifting from the classical concept of disobstruction surgery to the current concept of functional expansive surgery. We present our experience of 188 OSAS patients selected with sleep endoscopy and treated with Functional Expansive Pharyngoplasty.

Matherials and methods

188 OSAS patients underwent surgery between 2012 and 2016, 168 males and 20 females, mean age of 43.5 years and mean BMI 29.48 kg/m2. Every patient was subjected to a sleep polygraphy (type III monitoring), upper airways endoscopy with Muller's manouver, cephalometry and DISE. The patients presented a mean pre-treatment AHI of 36.6/h, a Lowest Oxygen Saturation of 79.1% and a cumulative sleep time below 90% of saturation of 15.5%. In all cases the sleep endoscopy showed a retropalatal/oropharyngeal lateral pattern of collapse. The surgical procedure consists of a tonsillectomy followed by isolation and section of the palatoglossal muscle, and its suspension to the pterygoid hamulus via suture. A control poligraphy was performed on all patients, with a mean follow-up of 7.9 +/- 4.5 months. We considered as a primary outcome a post-operative AHI reduction inferior to 15 events/h, and as secondary outcomes a postoperative AHI inferior to 20 events/h or an AHI reduction of more than 50% of the pre-operative value.

Results

The mean post-operative AHI registered is 12.3/h. 81% of the patients have a post-operative AHI less than 15/h; 86% have an AHI <20% and 91% of the patients have an AHI reduction of more than 50%. In all cases there has been a statistically significant improvement in oximetric parameters (mean LOS and cumulative sleep time below 90% of saturation) [$p<0.05$]. The results are not influenced by Friedman Score. The therapy failed in 16 cases, corresponding to the 8.7% of the total.

Conclusions

Functional Expansive Pharyngoplasty, developed thanks to the recent acquisitions derived from the implementation of DISE, offers a clear improvement in therapeutic results, 81% success rate in our series, compared to the classical techniques such as uvulopalatopharyngoplasty, with a reported success rate of 40-50% in the older series. An essential requirement is the correct selection of the patient, through a complete diagnostic work-up including a DISE.

SM-STS-11

Interest in basilingual tonsillectomy in the treatment of obstructive sleep apnea syndrome.

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Introduction:

The retro lingual space is considered one of the potential sights of obstruction identified in patients with obstructive sleep apnea syndrome (OSAS). Among the elements which can obstruct the airway at that level, one can point out hypertrophied lingual tonsils (LT).

The goal of this study is to measure the tolerance and efficacy of Lingual tonsillectomy in patients with OSAS.

Materials and methods:

A retrospective chart review was conducted recruiting all the OSA patients who either had failure or refused medical treatment and who underwent lingual tonsillectomy.

The diagnosis of lingual tonsil hypertrophy was made by a full ENT clinical examination using a flexible naso-fibroscopy , completed with an MRI and followed by a Drug Induced Sleep Endoscopy (DISE) .

The surgical intervention was carried out by either an endoscopic approach or by robotic surgery. Diode laser or coblation were used for ablation. The Criteria of judgment used to measure efficacy of lingual tonsillectomy was based on the 6 months post operative drop of AHI. The reduction of both snoring and Epworth Sleepiness scale (ESS) along with the post surgical symptom tolerance were considered as secondary judgment criteria.

Results: Eleven patients aged 44,3±12,6years were included. DISE was performed on 9 patients. All eleven patients had a LT ablation by an endoscopic approach. We observed a drop of AHI from 29.5±21.7/h to 11.6±9.6/h (p=0.005). Five patients had an AHI<10/h, which means a cure rate of 45%. The ESS dropped from 13±3.4 to 8.1±4.9 (p=0.012). No major post operative complications were observed.

Conclusion: LT can be considered as an effective treatment for OSAS when medical treatment failed and when there is a retrolingual obstruction due to lingual tonsil hypertrophy.

SM-STS-12

Minimal invasive surgery for mild OSA and snoring

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Introduction: Patients with snoring and obstructive sleep apnea (OSAS) experience the vibration of the pharyngeal tissues. Some of them may suffer from nasal obstruction as well. Snoring and OSAS may lead to low sleep quality, daytime tiredness and sleepiness.

Objective: 1. Analyse differences among minimal invasive procedures for snoring and mild OSAS, 2. Assess the efficacy of minimal invasive procedures on snoring, quality of sleep nad sleep parameters.

Material and methods: Adult patients with simple snoring and mild OSAS (AHI< 15). Study and control groups were mild OSAS and primary snoring groups respectively. All patients underwent polygraphy and filled out questionnaires for sleep quality. Rhinomanometry was performed in patients with hypertrophy of lower turbinates. The Epworth Sleepiness scale and NOSE scale scoring was analyzed. The following procedures for snoring and mild sleep apnea were performed: Radiofrequency induced thermotherapy of soft palate and base of tongue (RFITT) (n=170), RFITT of lower turbinates (n=185), laser assisted uvuloplasty using CO2 and diode lasers (LAUP) (n=265), injection snoreplasty (IS) (n=35).

Results:

Objectively, decreased of nasal resistance was shown after RFITT of lower turbinates. No significant improvement in AHI was observed after LAUP, RFITT and IS. In most cases the significant decrease of snoring and improvement in quality of sleep was shown.

Short videos of LAUP, RFITT and IS will be provided.

Conclusions:

Minimal invasive surgeries for snoring and mild OSA are relatively safe and office procedures with small number of postoperative complications. The success of surgery depends mostly on good patient selection.

SM-STS-13

Modified Expansión Pharyngoplasty using barbed sutures and removing supratonsilar fat: our results in OSAS.

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Introduction and objectives. The relevance of the lateral pharyngeal walls has been revealed in the recent years as one of the important areas causing upper airway (UA) collapse. Therefore, new surgical techniques have appeared in order to improve this collapse. Our aim is to evaluate the results obtained with a modified expansion pharyngoplasty (MEP) using barbed sutures and removing the supratonsillar fat, assessing objective and subjective data of our patients.

Materials and methods. This is a retrospective study of 19 surgically treated patients diagnosed from mild to severe OSAS who did not tolerate (or was not indicated) conventional treatment with CPAP. After a complete physical examination awake and under drug-induced sedation endoscopy, surgical treatment was performed. Surgical treatment included nasal surgery, MEP and tongue base surgery (midline glossectomy or lingual tonsillectomy using coblation) if needed. 3 to 6 months after surgery, a sleep study was performed and patients were interviewed about subjective data.

Results. Nineteen patients were enrolled, sixteen men and three women. The mean age was 43 years (range, 29-59 years), and the mean BMI was 28,1 kg/m2 (range, 22,6-34 kg/m2). Eleven patients (57,8%) were diagnosed of severe, three (15,8%) of moderate and five (26,3%) of mild OSAS. Simultaneous multilevel surgery was done in 10 patients (52,6%). The mean preoperative apnea-hypopnea index (AHI) for the entire group decreased from 30,7 ± 19,6 to 10,5 ± 10,4 (p=0,03) postoperatively. Lowest oxygen saturation improved from 80 ± 10,1 to 89 ± 5,1 (p=0,008), snoring was significantly reduced and the quality of life scale improved from 5,5 ± 2,8 to 8,4 ± 1,1 (p=0,02). Diurnal sleepiness measured with Epworth Sleepiness Scale decreased from 8,6 to 6,1 (p=0,06). In 9 patients only MEP was performed. Their AHI was 28 ± 14,5 preoperatively, and 8,7 ± 5,2 postoperatively (p=0,02). In the simultaneous multilevel surgery group, AHI changed from 24 ± 16 to 12,3 ± 14,1 (p=0,2). 9 patients were cured, 9 improved their severity and 1 remained as severe OSAS. Complications included 3 cases of bleeding, two of them needed surgical review, 2 cases of transient nasopharyngeal insufficiency during the first postoperative week and 12 partial suture extrusion that were corrected without consequences by cutting the suture 2 weeks after surgery.

Conclusions. Our MEP appears to be a good surgical method to treat UA collapse in OSAS patients.

SM-STS-14

Multilevel Management of the Snoring and mild obstructive Sleep-Apneea using bipolar Radiofrequency

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The bipolar Radiofrequency innovative Volume Reduction has by now firmly established and proven as a good option for the treatment of patients suffering from socially disruptive snoring and mild OSAS.

The therapeutically interest of the RaVoR consists principally on it superiority in terms of safety by comparable results to that of conventionally UPPP or laser-assisted uvulopalatoplasty.

It is a gentle method that can be performed in local anaesthesia on an outpatient basis and with little strain on the patient.

The personal method which take into account previous works on RF and palatal histological studies and is adapted to the anatomical and physiological peculiarity in the nasal and oropharyngeal regions/segments but also to its functionally unity, use a set of originals bipolar electrodes specially designated for the multi-level (turbinate, soft palate, posterior pillars and lingual tonsils) delivering of energy and RF generators manufactured by Sutter. The surgically techniques are discussed and video exemplified.

The present retrospective lecture, analyse the patient tolerance to the method, the safety and the effectiveness of multi-level procedures performed in one to three sessions according to the author's concept of graduate approach

Each segmental technique has proven to be a safe, simply, fast and effective mean for the treatment of snoring and selected cases of OSA.

The main indication of the method remain the snoring where could be considerate as being the procedure of first choice. Reducing the three soft obstructions sites in the upper airway by sleep-apnoea patients the method improves the air flow providing at least a better compliance to CPAP.

SM-STS-15

New Simple Suspension Sutures for obstructive sleep apnea

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Background: Snoring and obstructive sleep apnea (OSA) is a common problem. As the velopharyngeal soft tissues are the most collapsible part of the upper airway, most surgical procedures performed for treatment of snoring and OSA target velopharyngeal region.

Objective: to introduce and assess a new modification of minimally invasive expansion pharyngoplasty for obstructive sleep apnea (OSA) using bilateral new suspension sutures without tonsillectomy.

Setting: Tertiary University hospitals.

Subjects and Methods: This prospective study included 24 patients who were diagnosed to have OSA with Friedman stage II or III and type I Fujita. Using large rounded needle, bilateral suspension sutures were used to advance and stabilize palatotopharyngeas and palatoglossus muscles anterolaterally.

Results: Apnea hypopnea index was decreased significantly ($P < 0.0001$) from a mean of 30.45 ±4.32 preoperatively to 9.2 ±5.6 postoperatively. The lowest oxygen saturation also increased significantly from 79.25 ± 4.12 to 89.29 ± 4.12 ($p < 0.0001$). Moreover, the visual analogue score showed statistically significant reduction ($P < 0.0001$) in the snoring intensity from a preoperative mean (SD) of 8.2 (1.4) to 2.1 (1.4) at 6 months postoperatively. Significant Improvements ($P < 0.0001$) were also documented in the Epworth sleepiness scale as its mean ± SD decreased from 11.7 ± 2.9 preoperatively to 5.1 ± 2.2 postoperatively.

Conclusion: The described new suspension sutures could significantly correct OSA in patients with retropalatal obstruction and lateral pharyngeal walls collapse with easy applicability and no reported complication. It allows proper healing, negligible pain and rapid recovery.

SM-STS-16

palatopharyngeal surgery in OSA

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Abstract:

Introduction: Sleep medicine is a medical superspeciality devoted to the diagnosis and treatment of sleep disturbance and disorders. Obstructive sleep apnoea (OSA) is the most common type of sleep apnea and is caused by obstruction of the airway.

Material: Obstructive sleep apnoea (OSA). is usually associated with a reduction in blood oxygen saturation accompanied with snoring, daytime sleepiness, morning mood changes such as irritability ,anxiety and depression forgetfulness,Stroke,increased heart rate and/or blood pressure-heart failure, decreased sex drive, unexplained weight gain, increased urination and/or nocturia, frequent heartburn or gastroesophageal reflux disease, and heavy night sweats. Background factors: Male, Above 40 yrs., Obesity High Blood pressure, Diabetes, thick Neck .Children with OSA-failure to thrive may experience learning and memory deficits. Diagnosis defends on clinical assessment and Polysomnography

Diagnosis defends on clinical assessment &Polysomnography. Treatment: Weight Reduction, Lifestyle changes, Physical interventions like positive airway pressure-Continuous positive airway pressure (CPAP).), variable positive airway pressure, VPAP/ BiPAP, Nasal EPAP, automatic positive airway pressure, APAP/Auto CPAP, Oral appliance mandibular advancement devices or splints.

There are different options of Surgical treatments to modify airway anatomy: Nasal surgery-turbinectomy Septal surgery, Throat surgery Tonsillectomy and/or adenoidectomy, uvulopalatopharyngoplasty, Reduction of the tongue base- either with laser excision or radiofrequency ablation or robotic surgery, Genioglossus advancement, in which a small portion of the lower jaw that attaches to the tongue is moved forward, to pull the tongue away from the back of the airway. Hyoid suspension, in which the hyoid bone pulled forward from larynx. Maxillomandibular advancement,

Conclusion: Sleep medicine exciting, relatively new field. Management improves the quality and expectancy of life,

SM-STS-17

Pearls and Pitfalls in Peri-operative Management of the Patient with Sleep Apnea

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The OSA patient is unique. This patient has a small narrow airway beginning from the nose, palate and tongue region. Management of this patient is crucial in the success of treatment. Understanding the pitfalls and the pearls in the management is key to ensure safety and well-being of the OSA patient.

This symposium will discuss the uniqueness of the OSA patient, the airflow dynamics of the upper airway, the role of the nose in the OSA patient, the different types of airway evaluation available (DISE, etc), what works and what doesn't, palate differences, palate types, retro-palatal collapse patterns, the various palate surgery, and most importantly, why we tackle the tongue, the importance of the tongue in OSA, what issues do the tongue surgery bring; to end of, most crucial, would be the care of the patient post surgery, how much intensive care or high dependency monitoring is needed for the OSA patient and how to divide our resources, in order not to waste finance and man power.

The entire symposium will present data from latest medical and evidence based literature with up to date meta anaylsis of the various procedures and techniques, with relevance to the OSA patient, and their success rates

SM-STS-18

PREVALENCE AND MANAGEMENT OF SIMPLE SNORING AND SLEEP APNEA SYNDROME: A CROSS SECTIONAL STUDY

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Purpose: The objective of this study is to determine the prevalence of snoring and of sleep apnea syndrome (SAS) and treat sick patients.

Materials and methods: We conducted a cross-sectional study in ENT service by random probabilist sampling. The study period is from January to March 2014. Data collection is performed using the valid questionnaire of sleep group of the French Society of Otolaryngology.

Results: The sex ratio M / F is 0.7. The average age is 40.4 years. Only 4% of consultants have snoring as the main reason for consultation. Snoring is more than one year in 42% of snorers. The occurrence of apnea was noted in 26% of the respondents. Daytime sleepiness is assessed by the Epwort score. it's greater than 10 in 35%. SAS is confirmed in 10% of our cohort. The treatment is decided in 6% by continuous ventilation positive pressure, 3% by mandibular advancement device and 1% by surgical septoplasty.

Conclusion: We found a prevalence of 46% of simple snoring and 10% of SAS, while 4% consult for this reason. Our study has elucidated the nature underestimated of SAS. We insist on the importance of diagnosis and proper care of the patients in their entirety.

SM-STS-21

Surgery for Sleep Apnea – Pushing its Boundary

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(1)MADRAS ENT RESEARCH FOUNDATION, Chennai, India, (2)SPECIALITY ENT HOSPITAL, Mumbai, India, (3)STAR HOSPITALS, Hyderabad, India

Title of Symposium: Surgery for Sleep Apnea – Pushing its Boundary

Summary of symposium (max. 400 words):

Surgical management of Obstructive sleep apnea usually involves multi level obstruction, which has to be understood and dealt in a safe and systematic manner. In order to achieve the objective, protocols and selection criteria need to be developed and followed.

In this symposium, we would discuss the risks and benefits involved in performing multilevel surgery in single or multiple stages, such as coblation palatal surgeries and robotic tongue base procedures. We will discuss the extubation criteria and the role of elective tracheotomy, while highlighting the role of external framework surgery as a safe adjuvant.

Learning Objectives:

The guideline formulated by our Indian Association of Surgeons for Sleep Apnoea (IASSA) will help to understand, analyze and categorize various sites of obstruction happening in obstructive sleep apnea and will be able to decide and perform what kind of surgery.

Speaker 1:

Title of contribution: Defining the limits of Surgical Management of OSAS

Name: Prof. Mohan Kameswaran

Country: India

E-mail merfmk30@yahoo.com

Speaker 2:

Title of contribution: Protocol for identifying level of Obstruction: DISE Vs Sleep MRI

Name: Dr. P. Vijaya Krishnan

Country: India

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Speaker 3:

Title of contribution: Protocol for Multilevel Surgery: Single Stage Vs Multiple Stages

Name: Dr. Vikas Agrawal

Country: India

E-mail doctor@enthospital.com

Speaker 4:

Title of contribution: Intraop & Postoperative management protocol in OSAS Surgeries

Name: Dr. Srinivas Kishore

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SM-STS-22

TECHNICAL VARIANTS OF UVULOPALATOPHARYNGOPLASTY AND ITS COMPLICATIONS

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INTRODUCTION:

Obstructive sleep apnea, is a pathology that has received recent attention from the medical community. Uvulopalatopharyngoplasty (UPPP), is the most commonly performed operation for OSA. The UPPP suffered important changes over the years. The aim of this study is to compare different surgical modes of UPPP and their complications.

METHODS:

Retrospective cohort study. Assessment was made by reviewing medical records of the patients, who had undergone uvulopalatopharyngoplasty with or without nasal surgery (septoplasty and/or turbinectomy) in Otolaryngology service from January 1999 to January 2016. The charts were analyzed and subsequently evaluated data, from different uvulopalatopharyngoplasty techniques (FAIRBANKS TECHNIQUE, LATERAL PHARYNGOPLASTY (LP) and EXPANSION SPHINCTER PHARYNGOPLASTY (ESP)) and post-surgical complications inherent to the procedure performed.

RESULTS:

The final sample was composed of 97 patients, 85 male (87.6%) and 12 female (12.4%); the mean age was 44.8 years (ranged, 19-71 years), the mean BMI was 27.88 kg/m2 (range, 22.1-40.67 kg/m2), the mean AHI was 37.28 events/hours (range 5 - 106.6 events/hour).

Ninety-seven patients performed UPPP and nasal surgery (Septoplasty and Turbinectomy); 32 were submitted to FAIRBANKS technique, 34 to ESP and 31 to LP technique. Eighty-seven patients (89.7%) had no complications, 10 patients (10.3%) had complications, 8 (8.2%) were late complications and 2 (2.1%) were immediate. Patients undergoing ESP presented no immediate complications and only 2 patients (5.9%) presented late complications, being the two hospitalization for pain. Two patients (6.3%) underwent FAIRBANKS UPPP had respiratory depression as immediate complication and as a late complication 1 patient (3.1%) required hospitalization because of pain. Patients undergoing LP showed no immediate complications and 5 patients (16.1%) presented late complications, being 1 (3.2%) hospitalization due to pain, 2 (6.45%) subcutaneous emphysema and 2 (6.45%) bleeding requiring surgical re-approach

DISCUSSION:

Among the complications, two patients evolved with subcutaneous emphysema after LATERAL PHARYNGOPLASTY. Hospitalization due to pain was a complication which occurred regardless of the surgical technique. Respiratory depression was the only immediate complication of our study. This study demonstrate that AHI and BMI are not a risk factor for complications after UPPP

CONCLUSION:

Our study reinforces that the UPPP complications rates are low. There was no statistical difference between surgical techniques of UPPP and resulting complications. There was no significant difference between Age, BMI, AHI and EPW among patients with and without

postoperative complications. Research with control group and a higher number of cases are necessary for further investigations and correlations.

SM-STS-23

THE EVALUATION OF RESULTS OF EXPANSION SPHINCTER PHARYNGOPLASTY BY ACOUSTIC PHARYNGOMETRY

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Purpose: We mainly aimed to find answers to the following questions. i) Could we predict the success of expansion sphincter pharyngoplasty (ESP) with preoperative acoustic pharyngometric (AP) analysis in patients with sleep apnea? ii) Could we interpret the results of ESP by AP postoperatively?

Materials and Methods: Between October 2015 and July 2016, CPAP intolerant patients with obstructive sleep apnea, who referred to Hacettepe University ORL Department were included into our study. Candidates for ESF between 18 and 65 constituted our study group. Cases with hypertrophic tonsils (Mallampati 3/4), cases with significant tongue base pathology (Cormack Lahane 3/4), and cases with previous history of pharyngeal surgery were excluded.

All patients were analyzed by AP preoperatively and postoperatively. Polysomnography was repeated postoperatively for all of the cases. Preoperative (pre) and postoperative (post) apnea hypopnea index (AHI), pre and post minimal cross-sectional area (MCA). The difference between preAHI and postAHI, the difference between preMCA and postMCA were calculated. Median value of difference of MCA was used to divide the cases as less widened ones and more widened ones. The success was accepted in cases with reduction of AHI > %50 and postAHI < 20.

Results: 35 patients (26 male, 9 female with a mean age of 41.8±8.3) who had ESP were included into our study. Mean preBMI was 28.7±3.8 and mean postBMI was 28.4±4 with no significant difference (p:0.17). PreAHI (29.6±16.3) was found to be reduced to 18.2±18.1 and this improvement in AHI was found statistically significant (p<0.001). MCA was found to be significantly (p<0.001) increased postoperatively (preMCA: 1.13±0.4, postMCA: 2.7±0.4). 22 patients respond to ESP well while 13 were accepted as unsuccessful. Mean preMCA was 1,18±0.5 among responders while this mean was 1.06±0.4 for non-responders. The difference between these values was not significant (p:0.5)

We divided the cases into two group according to the median of the difference of the MCA (1.12 cm2). Success rate was found to be 45.5% in <1.12 group with a mean AHI difference of 10.4±20.5; while success rate was 54.5% with a mean AHI difference of 12.2±14. The success rates (p:0.96) and improvement of AHI (p:0.98) were not statistically significant between the groups. Improvement of AHI and difference of MCA was not found correlated (p<0.001).

Conclusion: AP is not suitable for predicting surgical success after ESP surgery and for selection of patients who will be successful.

SM-STS-24

The multimodal preemptive pain management approach for Patients with Obstructive Sleep Apnea Syndrome (OSAS) Undergoing Pharyngeal Surgery – A Retrospective Study

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(1)Tel-Aviv Sourasky medical Center, , Israel

Introduction

Continuous positive airway pressure (C-PAP) is considered to be the gold standard for OSAS treatment. Nevertheless, the reported compliance for C-PAP therapy in Israel is 30-35%. These patients are considered for surgical approaches, the most common are pharyngeal procedures. These are characterized by intense post-operative pain affecting recovery and exposing patients to serious complications. Pain management is challenging due to the lower pain threshold, higher susceptibility to drug induced respiratory inhibition and the relative high risk for post-operative bleeding. The multimodal preemptive pain management approach allows reduction of drug complication rate while increasing treatment efficiency.

Methods

We applied a multimodal preemptive analgesic protocol including Lyrica (pregabalin), Targin (Oxycode+Naloxon) and Optalgin (Dypirone) and PRN oxycode. The charts of 45 consecutive patients were reviewed retrospectively. All patients uderwent oropharyngeal surgery for OSAS. Pain evaluation was conducted using the Numeric Rating Scale (NRS) at least 3 times daily.

Results

45 patients were recruited. Males to females ratio was 26:19. Mean overall NRS was 4. NRS at morning (5.24) and evening (4.26) was significantly higher than at night (2.5), p<.0001. NRS for male was significantly lower than female (p-value 0.04). feeding tube efficiently prevented weight loss but did not affect pain perception.

Conclusion

The multimodal preemptive pain management approach is efficient for post oropharyngeal surgery. Resting pain is well controlled wile pain at swallowing remain intense and affects intake. Post-operative pain intensity manifests circadian rhythmicity. Pain perception is higher in female. This conclusion will assist in remodeling and improving the pain control protocol.

SM-STS-25

Uvulopalatopharyngoplasty combined with radiofrequency tongue base reduction and nasal surgery as one stage multilevel surgery for the treatment of obstructive sleep apnea syndrome

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(1)Yerevan State Medical University, Yerevan, Armenia, (2)Yerevan State Medical University, Medical Center "Erebouni", Yerevan, Armenia

Objective: In this study we investigated the outcome of uvulopalatopharyngoplasty (UPPP) combined with radiofrequency volume tissues reduction of the tongue base (RFTBR) and nasal surgery in patients with obstructive sleep apnea syndrome (OSAS) with nasal, palatal and retro lingual obstruction.

Methods: A retrospective cohort study was performed in patients with mild to severe OSAS. Thirty-six patients with OSAS who underwent RFTBR combined with UPPP, septoplasty and radiofrequency volume tissues reduction (RFVTR) of inferior nasal turbines completed this study. There were 28 men and 8 women. The ages ranged from 32 to 58 years (mean age ±SEM: 46 ±4.67). All of the preoperative examinations and the measurements including the BMI, visual analogue scoring system (VAS) for snoring, Epworth sleepiness scale (ESS), anterior active rhinomanometry (AAR) and polysomnography were repeated 6 months after the surgery. Surgical success was defined as AHI 50% reduction in AHI and response rate as reduction of AHI between 20 and 50%. The overall response rate was defined as more than 20% reduction in AHI.

Results: BMI was not changed significantly before (28.52±5.15 kg/m2) and after surgery (28.56±5.18kg/m2). Objective success defined as a reduction of AHI by □50% and AHI < 20 was obtained in 33 of the 36 patients (91.7%). Mean AHI decreased from 46.4±6.12/hour to 10.35±5.36/hour (p<0.05) and mean reduction rate of AHI was 80.2±7.34% for all 36 patients, 84.4 ± 5.14% in patients with Friedman's anatomical stage II and 72.14±7.35% with stage III (p<0.05 for both). The mean snoring sound decreased significantly from 8.25±0.63 to 2.06±1.04 at 6th month after operation (p<0.05). The mean value for ESS was significantly decreased from 12.6 ± 2.16 to 5.2 ± 1.47 at 6th month after operation (p<0.05). Rhinomanometric data disclosed a significant difference between pre- and postoperative phases for all papatients after 6 months in postoperation period. The mean nasal airflow (cm3/s) was 168.9±46.7 in preoperation period, while after 6 months in postoperation period it was increased to 623.4±116.8 (P<0.05).

Conclusion: Now is well recognized that improving nasal resistance medically or surgically can improve sleep quality. Single-session RFTBR combined with uvulopalatalpharyngoplasty and nasal surgery is an effective treatment for reducing symptoms and AHI in OSAS patients with multilevel obstruction. It is also a safe treatment because of minimal postoperative morbidity and complication.

SM-TBT-01

A novel implantable device for the treatment of obstructive sleep apnea - safety, feasibility and results.

V.Pavelec*(1)

(1)LENTE Clinic, Plzen, Czech Republic

Abstract

Objective: Many cases of obstructive sleep apnea (OSA) involve collapse of the tongue base and soft palate during sleep, causing occlusion of the upper airway and leading to oxygen desaturation. Existing therapies can be effective, but are plagued by patient adherence issues and the invasiveness of surgical approaches. A new, minimally invasive implant for OSA has been developed that is elastic and contracts a few weeks after deployment, stabilizing the surrounding soft tissue. The device has had good outcomes in preclinical testing; this report describes the preliminary feasibility and safety of its implementation in humans.

Materials and methods: A single center case series is presented from a 40 subject prospective, multi-center, single-arm, feasibility study. Subjects were adults with moderate-severe OSA who had previously failed or refused conventional continuous positive airway pressure (CPAP) treatment. Intraoperative feasibility data, post-operative pain, and safety information were collected for a 30-day postoperative period.

Results: 20 subjects (19 men, 1 women; average age of 46.4 years); each received two tongue base implants and two soft palate implants. Surgical procedure time averaged 46 minutes. Post-surgical pain resolved readily in most cases; at 30 days post-implantation, 4 subjects (22%) reported pain averaging 1.25 out of 10. Adverse events were generally the mild and expected sequelae of a surgical procedure with general anesthesia and intra-oral manipulation. The device was well-tolerated. Implant extrusions were reported with soft palate implants (n=9), while tongue base implants required few revisions (n=2). Quantitative and qualitative sleep effectiveness outcomes (including full-night polysomnographic and quality of life measures) will be presented.

Conclusion: Implantation of the device was feasible. Although a relatively high rate of extrusions occurred in the now-discontinued palate implants, the tongue base implants were largely stable and well-tolerated. The minimally-invasive and maintenance-free implant may provide a new alternative to higher-morbidity surgical procedures.

SM-TBT-02

Minimally Invasive Implantable Approaches for OSA

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(1)LENTE Clinic, Plzen, Czech Republic

PROGRAM DESCRIPTION

The program will focus on the latest medical devices, associated costs and outcomes for treatment of Obstructive Sleep Apnea. After a short introduction and general overview of surgical management of OSA, there will be panelists discussion on the following topics:

Round Table organizer/moderator: Vaclav Pavelec

Maria Suurna (USA): Implantable Upper Airway Neurostimulation: Current Approach

Joachim Maurer (Germany): Implantable Upper Airway Neurostimulation: New Horizons

Vaclav Pavelec (Czech Republic): Base of tongue implants: Where We Are Now

The panel will address the importance to identify the level and nature of the airway obstruction during sleep in patients with OSA. The discussion will focus on use of different medical devices for treatment OSA. Patient satisfaction and compliance with different treatment modalities will be presented.

OUTCOME OBJECTIVES

This symposium gives an overview of current state of the art treatment of OSA with new medical devices. The participants will understand the importance of base of tongue collapse in pathophysiology of OSA and the role drug induced sleep endoscopy (DISE) in treatment selection. The participants will become familiar with currently available techniques utilizing innovative technology, their advantages and limitations. The participants will learn about future direction of medical advances in treatment of OSA. At the end the audience will be able to understand the indications for use of medical devices in treatment of OSA. This should help the participants to offer appropriate and comprehensive treatment for OSA.

SM-TBT-03

Static versus dynamic examination in decision making in tongue Base surgery

A.Elsobki*(1)

(1)Mansoura University Egypt, Mansoura, Egypt

Introduction: in most institutes decision making in tongue Base surgery is based on sleep endoscopy in which the posterior airway space is examined during pharmacologically induced sleep neglecting the static tongue position and tongue palate interaction. In our view this is a part of a big story and the few minuets in which we look at the airway are less than ideal..even with transoral sleep endoscopy the tongue palate interaction is not fully studied at all sleep stages

Aim of the work: to evaluate the impact of incorporating static tongue position in decision making either to perform tongue surgery or not

Patients and methods: we compared mean AHI reduction and cure rate in two groups of patients with Fridman tongue position 3 and 4 the first group was managed by only palatal surgery according to sleep endoscopy findings and patients with both tongue Base and palatal level collapse were excluded..the other group of patients were managed by both palatal surgery and genioglossus advancement also patients with tongue Base collapse during sleep endoscopy were excluded

Results: mean AHI reduction for the first group was 72 percent and for the second group was 83 percent. the cure rate for the first group (AHI below 5) was 40 percent and for the second group was 63 percent

Conclusion: management of the tongue Base in friedman tongue position 3 or 4 does improve outcome in sleep surgery even if sleep endoscopy points to isolated palatal level collapse

SM-TE-01

Hypoglossal nerve stimulation for Obstructive Sleep Apnea in Spain

P.Baptista*(1), J.Alcalde navarrete(2), E.Urresterrazu(2), M.Alegre(2)

(1)Clinica Universidad de Navarra., Pamplona, spain, Spain, (2)Clinica Universidad de Navarra, Pamplona, Spain

Introduction

Obstructive sleep apnea (OSA) is a multifactorial disease that affects a large part of the population. The most effective treatment to this moment for the majority of patients has been the use of CPAP. However, there are a group of patients in whom the use of CPAP is poor or null. Alternatively, various surgical techniques have been developed involving a modification of the anatomy of the upper airway, with variable results.

Hypoglossal nerve stimulation implant nerve stimulation has been commercially available in the past 2 years and has proved excellent results in CPAP intolerant patients. This technique involves the placement of the neurostimulation implant at the anterior chest wall, with a sensor electrode at the lateral chest wall and a stimulating electrode and the distal end of the hypoglossal nerve over the fibers that go to the protrude tongue muscles.

We present of results of our first 8 patients with moderate moderate –severe OSA with intolerance to CPAP that were implanted.

Materials and Methods

Four patients, (7 male and 1 female) were implanted with the Inspire® Hypoglossal nerve stimulation system, based on anatomic, functional, Drug induced endoscopy, polysomnographic (PSG) results and intolerance to CPAP. All surgical procedures were performed in the Department of ENT, of the Clinica Universidad de Navarra(Pamplona, Spain) in collaboration with the Department of Neurophisiology, that performed monitorization, activation and polysomnography (PSG) at 2 months after the implantation.

Results

A detailed description of preliminary results at 2 months is performed with of QOL, Epworth sleepiness scales and pre-post, PSG and Drug induced endoscopy (DISE)

Patients showed a major improvement of post-operartory parameters.

Conclusion:

We present of results, complications in our first eight patients implanted with the Inspire Hypoglossal nerve stimulator in Spain. Results showed an important improvement of patients QOL, Epwoth Sleepiness scale and PSG parameters in the majority of patients. An adequate selection of patients is necessary for this achievement.

SM-TE-02

Impact of genioglossus stimulation (Inspire ® therapy) on the objective level of alertness of adults suffering from severe OSA

P.Philip*(1), J.Micoulaud-franchi*(1), P.Monteyrol*(1), S.Bioulac(1), O.Coste(1), G.Penchet(1), E.Cuny(1)

(1)CHU de Bordeaux, , France

Aims

Inspire® therapy is a stimulation technique of the hypoglossal nerve via an implanted stimulator. It has proven its efficacy in reducing apnea-hypopnea index (IAH) and subjective level of alertness in moderate and severe Obstructive Sleep Apnea (OSA) with a three year follow-up. No study has yet evaluated its impact on objective alertness. We hypothesized that Inspire® therapy will reduce the objective level of alertness.

Materials and Methods

The Maintenance of Wakefulness Test (MWT) was used to measure the objective level of alertness 6 months after the implantation of Inspire® therapy (4 months after the titration polysomnography (PSG)). A PSG was recorder the night before the MWT.

Results

10 male patients were implanted (mean age = 53.3± 8.7 years, mean body mass index = 29.0±3.5, mean AHI = 47.2/h±12.8, mean micro-arousal = 39.1/h±15.2, mean ESS = 14.8±3.3, and mean latencies on the MWT = 24.7±13.1 min. Six months after the implantation, the mean IAH was 11.7/h±6.4, the mean micro-arousal was 10.3/h±7.4, the mean ESS was 9.2±2.2 and the mean latencies on the MWT was 33.7±10.7 min. All these parameters were significantly improved by the therapeutics ($p<0.05$).

Conclusion

Inspire® therapy improved significantly the objective level of alertness. Further studies are needed to confirm on a larger sample these results.

SM-TE-03

İmplantation of Hypoglossal Nerve Stimulator

M.Karaman*(1)

(1)İstanbul Medipol University, ENT Department, Turkey, , Turkey

The objective and content of my proposal: OSAS is a disease with multi-level obstructions. There are many diagnostic methods. The fact is that the level (velum, oropharynx, tongue base, epiglottis), type (circumferential, anteroposterior, lateral) and severity of collapse (partial, complete) could not always predict the outcome of upper airway surgery. Along with endoscopic findings, the predictive value of known polysomnographic and clinical variables (e.g., AHI, body mass index [BMI]) could not always predict the outcome of upper airway surgery in OSA patients.

Purpose of the Keynote lecture: There is a right direction of the chaos caused by the multiplicity of surgery procedures and inability of the ideal method. These realities are especially valid for the OSAS patient with retrolingual pathologies. Thus, we have some troubles in diagnosis and surgical treatment of OSAS. The purpose may be to inform the details especially on tongue base treatment (Tongue Electrostimulation..) with the exposition of the video in keynote lecture.

Panelist's name: Prof. Dr. Murat KARAMAN;

Panelist's nationality: Turkey; İstanbul Medipol University, ENT Department.

Panelist's prefered topics: Keynote lecture with the exposition of the video about "İmplantation of Hypoglossal Nerve Stimulator"

Themes of Sleep Medecine: Tongue Base Treatment; Tongue Electrostimulation; Surgical Treatment of Snoring /OSAS.

SM-TE-04

Patient Outcomes and Therapy Adherence of selective Upper Airway Stimulation for Treatment of OSA: Preliminary Results from the Multi-Center ADHERE Registry

C.Heiser*(1), E.Thaler(2), M.Boon(3), R.Soose(4)

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Authors: Clemens Heiser, Erica Thaler, Ryan Soose, and Maurits Boon on behalf of the ADHERE UAS Registry

Introduction

Upper airway stimulation (UAS) is an FDA approved treatment option for obstructive sleep apnea (OSA) in patients who cannot adhere to positive airway pressure (CPAP or Bilevel). Previous studies have demonstrated a reduction of OSA severity and improvement of patient-reported outcomes related to UAS in controlled clinical trials. A registry of UAS patients will provide insight into patient centered outcomes and therapy adherence in a real-world setting.

Methods

The Adherence and Outcome of UAS for OSA (ADHERE UAS) is an international registry of consecutive patients who have received an implanted UAS system (Inspire Medical Systems, USA). The registry collects baseline characteristics, patient outcome measures and therapy adherence from the therapy titration visit and at a 12-month visit post-implant. Outcome measures include the pre- and post-implant AHI and the Epworth Sleepiness Scale (ESS). The post-implant AHI is measured during the in-lab polysomnographic (PSG) titration study and at 12-months with PSG or home sleep testing. The Registry is intended to enroll 2,500 patients.

Results

As of Jan 24, 2017, a total of 100 participants enrolled in the registry. The mean age was 61.1 ± 11.3 years (85% male) and BMI of 29.4 ± 3.6 kg/m2. The AHI was reduced from a baseline of 38.9 ± 16.2 to 5.9 ± 10.2 and 7.6 ± 8.3 events/h at the titration and 12-month visits ($p<0.001$ for both visits vs. baseline). After the titration, 68%, 84% and 90% of participants had an AHI of < 5, <10, <15. The ESS changed from 11.6 ± 6.2 to 6.7 ± 4.6 and 6.2 ± 4.1 at the titration and final visit. Therapy adherence was 6.5 ± 1.9 and 5.9 ± 2.3 hrs/night at the titration and the 12-month visit.

Conclusion

Upper airway stimulation reduced OSA severity, and improved patient reported measures of daytime sleepiness. The therapy adherence remained high after 12 months among the registry participants who previously could not adhere to CPAP.

SM-TE-05

Selective Upper Airway Stimulation – Does it change the surgical treatment of obstructive sleep apnea in future?

C.Heiser*(1)

(1)Department of Otorhinolaryngology, Head and Neck Surgery, Technical University of Munich, Munich, Germany

This roundtable brings together international faculty to discuss the future of the new technique of selective upper airway stimulation. Each of the surgeons will share their viewpoint and engage in discussion on essential clinical and scientific questions pertaining to the role of neurostimulation in treatment of OSA.

Suggested topics:

1. Review of the Upper Airway Stimulation: scientific data and global experience

2. Patient selection – which tools do we need? (DISE, baseline characteristics, anatomical landmarks)

3. New surgical approach regarding implant technique (NIM, Neuro-anatomy, UAS sweet spot)

4. What needs to be done after implanting? (titration, long term follow up of UAS patients)

5. Trouble shooting afterwards! What can we except and what can be done?

Five minutes will be dedicated to the presentation of each topic, immediately followed by 7 minute expert discussion to address pertinent innovative and controversial aspects.

Panellists:

Maria V. Suurna, Weill Cornell Medical College, New York, USA

Clemens Heiser, Department of Otorhinolaryngology, Head and Neck Surgery, Klinikum rechts der Isar, Technical University of Munich, Germany

Ryan Soose, Department of Otolaryngology, University of Pittsburgh, Pittsburgh, Pennsylvania, USA

J. Ulrich Sommer, Department of Otorhinolaryngology, Head and Neck Surgery, University Hospital Mannheim, Germany.

Oliver Vanderveken, Department of Otorhinolaryngology-Head and Neck Surgery, Antwerp University Hospital, Edegem, Belgium Faculty of Medicine and Health Sciences, University of Antwerp, Belgium.

SM-TE-06

Selective upper airway stimulation for obstructive sleep apnea: a single center clinical experience with 80 patients

B.Hofauer*(1)

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Benedikt Hofauer MD, Andreas Knopf MD, Markus Wirth MD, Clemens Heiser MD

Department of Otorhinolaryngology / Head and Neck Surgery, Klinikum rechts der Isar, Technical University Munich, Germany

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

Methods: Eighty patients who received a UAS device (Inspire Medical Systems, Maple Grove, MN, USA) were included. Treatment outcome was evaluated at 2, 3, 6, 12, and 24 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), adverse events and adherence to therapy. Sher criteria were used to evaluate treatment response.

Results: Mean age was 59.6 years with 77 patients being male. Mean BMI was 28.8kg/m2. Mean pre-implantation AHI of 32.9/h could be reduced to 7.0/h after 24 months ($p<0.001$). Mean pre-implantation ODI of 30.7/h could be reduced to 9.5/h after 24 months ($p=0.003$). Mean pre-implantation ESS of 12.6 could be reduced to 5.7 after 24 months ($p=0.006$). Serious adverse events during the surgical procedure or postoperative course did not occur. Therapy adherence was a usage of 6.6 hours/night after 24 months.

Conclusion: OSA severity and subjective daytime sleepiness was significantly improved in patients with moderate to severe OSA after receiving sUAS therapy. Patients maintained high adherence to therapy use after 24 months. sUAS has been shown to be successfully implemented in the routine clinical management of OSA outside of a clinical trial setting.

SM-TE-07

Selective upper Airway Stimulation for Obstructive Sleep Apnea: German Post Market Study

C.Heiser*(1), B.Hofauer(2), J.Sommer(3), J.Maurer(3), A.Seitz(4), A.Steffen(4)

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Objective: Selective hypoglossal nerve stimulation is a novel treatment option for obstructive sleep apnea (OSA) patients. In well-designed clinicical trials (STAR trial) its efficacy could be proven. This multicenter clinical trial collected data to show the effectiveness and safety of selective upper airway stimulation (sUAS) in a routine clinical setting.

Methods: This prospective study in three German centers enrolled consecutive patients with apnea-hypopnea index (AHI) between 15 and 65 and BMI < 35kg/m², who received an UAS implant (Inspire Medical Systems, USA). Data collection included baseline characteristics, and post-op home sleep apnea test and patient reported outcome of Epworth Sleepiness Scale (ESS) and Functional Outcome of Sleep Questionnaire (FOSQ) at 6 and 12 months.

Results: The study enrolled 60 patients of age 56.8 9.1 years (58m, 2f) and BMI 28.8 3.6 kg/m2. Among them, the AHI changed from 28.6 13.2 to 9.5 14.8 ($p<0.05$), ESS from 13.0 5.3 to 6.5 4.5 ($p<0.05$) and FOSQ from 13.7 3.6 to 17.5 3.0 ($p<0.05$) from baseline to 6 months. The average usage time of the system was 39.1 ± 14.9 hours per week.

Conclusion: Selective upper airway stimulation is successfully implemented in the routine clinical management of OSA patients. Its safety and efficacy could be proven again by this trial.

SM-TE-08

Upper Airway Stimulation for Obstructive Sleep Apnea: Patient Reported Outcomes after 48 Months of Follow-up

O.Vanderveken*(1), N.De vries(2), J.Maurer(3), P.Van de heyning(4)

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Introduction: Upper airway stimulation has been shown to be safe and effective in participants with moderate-to-severe OSA in a large cohort study (STAR Trial) after 12 months of follow-up [1]. This study was aimed to assess patient reported outcomes after 48 months of follow-up.

Methods: A total of 126 participants received an implanted upper airway stimulation system (Inspire Medical Systems, Minnesota, USA) in a prospective phase III trial. Patient reported outcomes were collected every 6 months including the Epworth Sleepiness Scale (ESS) and the Functional Outcomes of Sleep Questionnaire (FOSQ) and were compared to pre-implantation baseline.

Results: A total of 96 and 60 participants completed follow up at 42 and 48 months, respectively. Data collection is on-going with 48 month visit completed by June 2016. ESS reduced significantly from 11.6 (5.0) at baseline to 7.0 (4.7) at 42 months ($p < 0.01$) and 7.7 (5.2) at 48 months ($p<0.01$). Similarly, FOSQ improved significantly from 14.3 (3.2) at baseline to 17.5 (2.8) at 42 months ($p < 0.01$) and 17.5 (2.8) at 48 months ($p < 0.01$).

Conclusion: Upper airway stimulation via cranial nerve XII maintains a sustained benefit on patient reported outcome measures (ESS and FOSQ) after 4 years of follow-up.

Reference:

Upper-airway stimulation for obstructive sleep apnea. Strollo PJ, Soose RJ, Maurer JT, and et al for the STAR Trial Group. N Engl J Med 2014; 370:139-49.

Olivier M Vanderveken, Nico de Vries, Joachim T Maurer, Paul Van de Heyning on behalf of STAR trial investigators

SM-TS-02

Customized 3D-printed CPAP Mask Interface for OSA: A Pilot Study

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(1)Tan Tock Seng Hospital, Singapore, Singapore, (2)Tan Tock Seng Hospital, , Singapore

OBJECTIVES: The objectives of this study is to firstly to evaluate the clinical efficacy of a customized 3D-printed Continuous Positive Airway Pressure (CPAP) mask interface against conventional CPAP mask interfaces in the treatment of Obstructive Sleep Apnea (OSA). Secondly, this study aims to validate the increased adherence to CPAP therapy and comfort of customized CPAP mask as compared to the conventional mask for OSA CPAP therapy, which has previously described in the literature.

MATERIALS & METHODS: This study is a prospective, randomized two-period crossover trial of 20 patients with severe OSA - Apnea-Hypopnea Index (AHI) ≥ 30/hour. All subjects are fitted with 3D-printed CPAP mask and a conventional mask after diagnosis of severe OSA. The subjects then undergo 14 days of home-based CPAP therapy trial using the 3D-printed mask or conventional mask before crossing over to a further 14 days of CPAP therapy using the remaining unused mask. Outcomes measured include measures of clinical efficacy (residual AHI, CPAP usage, Epworth Sleepiness Score, Calgary Sleep Apnea Quality of Life Index (SAQLI)) and subjective comfort questionnaire.

RESULTS: Pending (Results of the pilot study are still pending as data collection is ongoing and scheduled for completion in February 2017)

CONCLUSION: We present the data of our pilot study on the clinical efficacy and comfort outcome measures of modern customized 3D-printed CPAP mask interface in the treatment of severe OSA.

SM-TS-03

Endovascular diode Laser treatment in venous malformations of the upper aerodigestive tract

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Objective: Venous malformations of the upper aero-digestive tract can cause pain, dysphagia, obstructive sleep apnea and sometimes bleeding issues. We studied the effectiveness of 980 nm diode endovascular laser therapy on dysphagia and sleep apnea.

Methods: This is a 2007-2014 retrospective study in our vascular anomalies center. Data on patients' clinical history, polysomonography, MRI and treatment was collected. All patients received laser treatment and we decided to evaluate the effects objectively and subjectively. Patients were contacted for Epworth and EAT-10 scores to evaluate sleepiness and dysphagia before and after laser therapy. Apnea-Hypopnea Index was also statistically compared in patients with obstructive sleep apnea.

Results: We included 32 patients (mean age 41) presenting obstructive sleep apnea (n=18) and dysphagia (n=13). Patients had on average 2 procedures each with a mean hospital stay was of 2.7 days. Out of the 65 procedures, transfusion for bleeding was required 4 times (6%) and there was no emergency tracheotomy. The mean follow-up was of 39 months. The average Epworth score fell from 17.3 to 10.4 (p=0.015), EAT-10 score from 8.2 to 3.5 (p=0.002) and Apnea-Hypopnea Index from 47.5 to 24.7 (p=0.01). Concerning patients with obstructive sleep apnea, 89% required Continuous Positive Pressure before laser treatment down to 50% afterwards (p=0.016).

Conclusion: Diode endovenous laser treatment seems to be a safe and effective treatment option in venous malformation of the upper airways. A multimodal approach must be discussed in a specialized multidisciplinary clinic to best tailor treatments for each patient.

SM-TS-04

From comparative anatomy and the in-out contact hypothesis, surgical strategy of upper airway respiratory corridors and results

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Comparative endoscopic examination of a sample of primates: Lesser, Great Apes and Humans seems to illustrate that soft palate strengthening preceding paramedian shortening can be a major observation in regard breathing security of the upper airway track as well the simultaneous modification of a closed U epiglottis to an open U one, leading to the creation of paraépiglottic corridors.

The authors hypothesise that the "contact-lines" during inspiration in between soft palate-tongue, tongue-epiglottis and expiration in between epiglottis-tongue, tongue-soft palate, are of great physiological importance in breathing security of the upper airway track. Air passage between these structures (soft palate-tongue, tongue-epiglottis, epiglottis-tongue, tongue-soft palate) coming in contact, depends on the presence of an infinity angle in between them. Laxity or folding of perimuscular tissues in these contact paramedian areas fill up infinity grooves where air infiltrates. This explains the physiological importance of perimuscular tissues in air "in-take and out-take" of the upper airway track. It can also give an explanation to discrepancies observed after upper airway blind enlargement. Surgery of the upper airway track should concentrate on these contact lines by resection or destruction of mucosal floating tissue of uvula's edges and resection or destruction of paramedian soft palate perimuscular tissues (mucosal or lymphoid) of palatopharyngeus muscles without any muscle damage (section or resection). Perimuscular tissue resection or destruction is strengthening soft palate median bulge all the way from the retro palatal area up to uvula's extremity and creates the condition of air passage in between the "contact line" (infinity angle when the tongue comes backwards). It optimizes paramedian security corridors at the oropharyngeal level and optimize the in between uvula and epiglottis median one when uvulo-epiglottis contact is lost (long airways). Resection or destruction of mucosal folding of anterior face of epiglottis or median pre-epiglottic lymphoid tissue can increase epiglottis anterior projection and rigidity in posterior displacement. Resection or destruction of mucosal folding or lymphoid tissue of epiglottis's edges and over pharyngoepiglottic folds and lateral paraepiglottic pharyngeal wall, can optimize tongue-epiglottis and epiglottis tongue contact relation and air infiltration towards para-epiglottic security breathing corridors. The authors prospect modifications of intraluminal forces acting to collapse the airway that may have implications on respiratory patterns. Surgical strategy and results of the upper airway respiratory corridors are illustrated.

SM-TS-05

Management Algorithm for Snoring and Obstructive Sleep Apnea: A Multidisciplinary Approach

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'- Introduce and standardize a multidisciplinary snoring and obstructive sleep apnea (OSA) management algorithm with proposed treatment models.

- Obstructive sleep-disordered breathing (OSDB) represents a group of physiopathologic conditions characterized by an abnormal respiratory pattern during sleep that can be isolated or can coexist with other respiratory, nervous, cardiovascular, or endocrine diseases. In general, snoring is at one end of a clinical continuum with an opposite extreme of severe OSA. So everyone suffering from OSDB snores but not everyone who snores has SDB .

OSDB is a multi-factorial and multilevel condition. The risk factors that may cause OSDB includes obesity, increased neck circumference, craniofacial abnormalities, hypothyroidism and acromegaly. Levels of upper airway obstruction include different causes of nasal obstruction, nasopharyngeal masses, hypertrophied tonsils, elongated and/or thickened palate and uvula, lingual tonsillar hypertrophy, macroglossia – acromegaly, micrognathia – congenital or acquired.

Therapeutic approaches include non-surgical and surgical modalities aiming at relieving the upper airway obstruction . As for obesity-related sleep apnea, weight reduction may reduce obstructive episodes, improve blood oxygenation and reduce daytime drowsiness.

Traditionally, the otolaryngologist has been the primary medical reference for patients suffering from OSDB. For proper diagnosis and management of this condition, the interaction of the multidisciplinary team members is deemed necessary and essential .

The current study aims at addressing a management algorithm for snoring and OSA patients with patient’s categorization into proposed treatment models for better outcome results.

SM-TS-07

The clinical outcome of Radiofrequency ablation as primary treatment for mild to moderate Obstructive sleep abnea.

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Obstructive sleep apnea (OSA) is the most common type of sleep apnea and is caused by complete or partial obstructions of the upper airway. The obstruction can take place at one or multilevel. Radiofrequency ablation is capable of soft tissue volume reduction which can be very effective in treating the mild to moderate OSA.

Objectives:

To evaluate outcomes of radiofrequency ablation for the management

of mild to moderate OSA

To explore the impact of successful Radiofrequency on the quality of

life and symptoms

SUBJECTS:

Outcomes for 50 patients with diagnosis of mild to moderate

obstructive sleep apnea admitted at under ENT unit at tertiary Hospital Oman from 2012 to 2015.

Methods:

A retrospective review of patients who had undergone multilevel

Radiofrequency ablation from 2012 to 2015 was enrolled.

Data was collected from the computer including history (age, gender, pre /postoperative sleep study, level of obstruction), preoperative examination, investigation, drug- induced sleep endoscopy(DISE), type of surgery, postoperative F/u.

Patent who miss pre/postoperative f/u excluded from the study.

Main outcome measures: Surgical success defined by patients resolution of symptoms.

Surgical failure defined as no symptomatic reduction

Result:

A total of 50 patients with apnea hypopnea index (AHI) between 5 and 30 events per hour, most of the patient ware having multilevel obstruction, no morbid obesity . The success rate at 6months and 12 months postoperative was 95%.

Conclusions:

Radiofrequency ablation treatment may be effective in mild to moderate OSA as the first-line treatment.

Keywords: Radiofrequency ablation, OSA, Sleep study ,DIES