Sleep & OSA
Pharmac Seminar
21st November 2018

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Auckland DHB

Disclosures

- Public/private mix
- TEAC and Auckland Surgical VTC
- Primary interest in Sleep Apnoea and functional upper airway surgery including rhinoplasty

ENT in Primary Care

- More than 10% of GP workload
- Less than 10% of medical students do ENT

Clinical scenarios

“blocked left ear with dull hearing, ringing, discomfort and dizziness”

“always has sinus, nose is blocked with headache and brain fog”

“sticking sensation with difficulty swallowing, weight loss, croaky voice and swollen glands”

Sleep and OSA

Sleep

- Circadian rhythm
- 8 hours a day
- Stages –
  - NREM 1 & 2
  - NREM 3 & 4
  - REM
- Making new neural connections
- Weeding out old ones
- Consolidating connections
- Outside the box connections

Sleep - benefits

- Cardiovascular - protective
- Metabolic – insulin sensitivity
- Immune – infections, cancer
- Cognitive – learning, creativity
- Social/cultural – happiness, positivity
- Economic

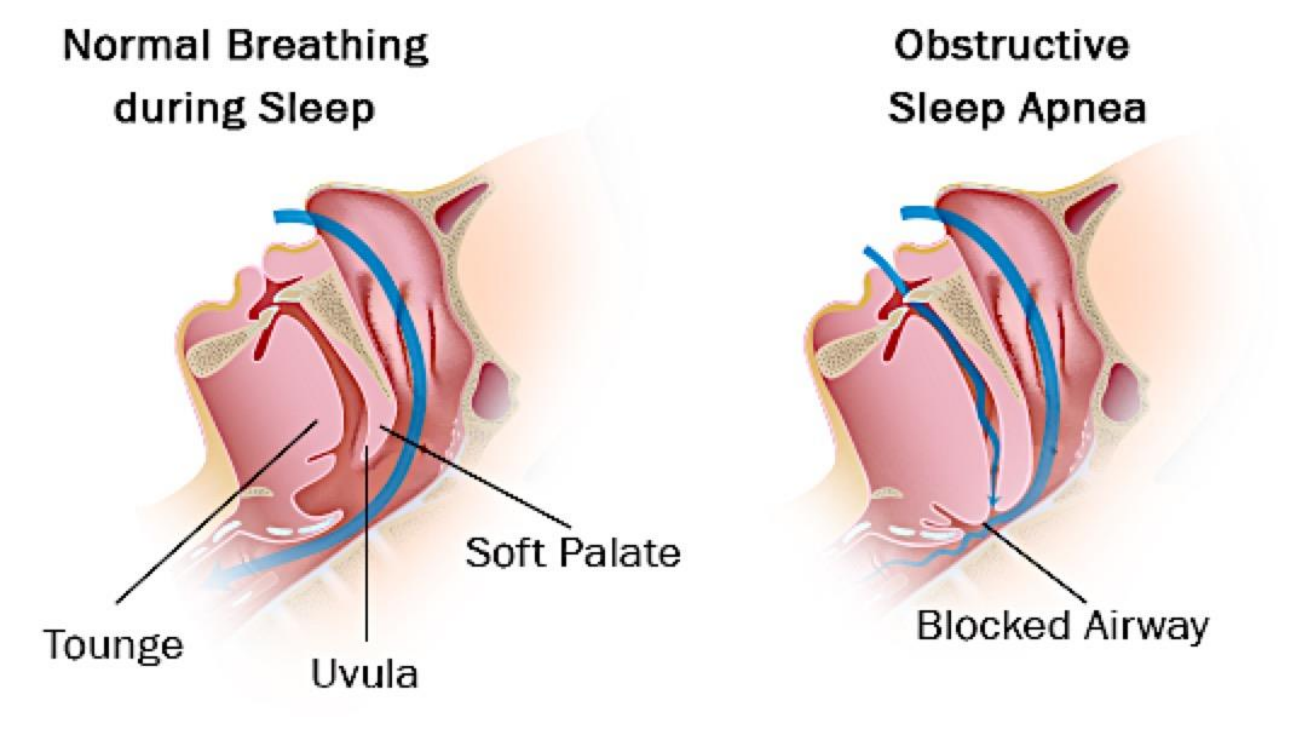
Sleep deprivation

- Cardiovascular – hypertension, IHD
- Metabolic – DM, obesity
- Immune – infections, cancer
- Cognitive – decline, dementia, psychological
- Social/cultural – conflict
- Economic – productivity, accidents

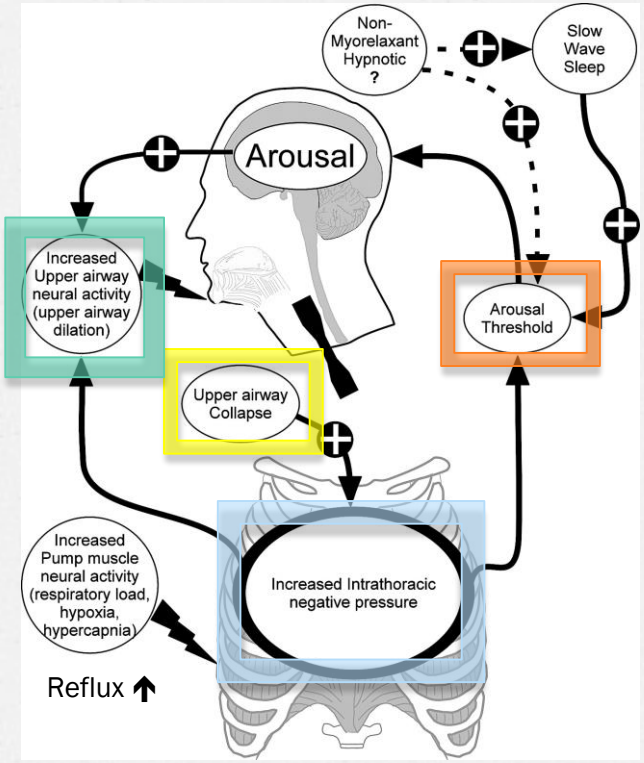
OSA - spectrum

- Sleep disordered breathing
- Snoring → mild / moderate / severe OSA
- UARS

OSA - pathophysiology



OSA - pathophysiology



OSA - presentation

- Physical fatigue
- Reflux
- DM, obesity
- Hypertension
- Ischaemic heart disease
- Heart failure
- Strokes
- Respiratory failure
- Reproductive issues

OSA – disease burden

- AHI
- Epworth Sleepiness Scale
- Fatigue Assessment Score

OSA – disease burden

Eur Arch Otorhinolaryngo
DOI 10.1007/s00405-016-

EDITORIAL

The SLEEP (

therapy

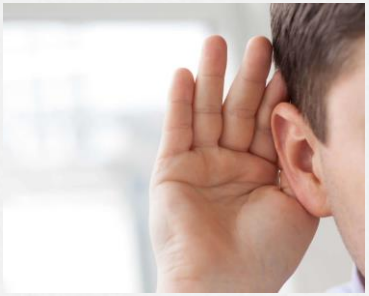
Kenny P. Pang[1] · Bri

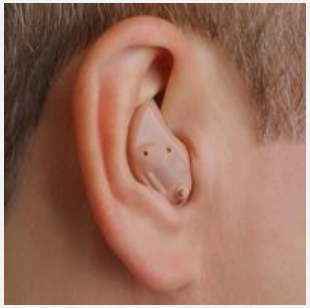
p apnea

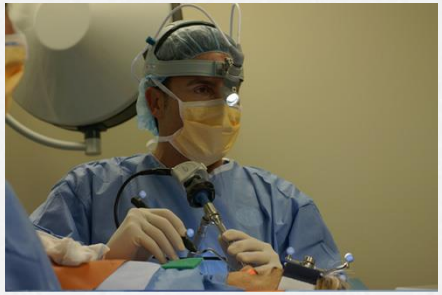
CrossMark

S	Snoring VAS—improvement in VAS by five points
L	Latency of sleep onset (PSG or MLST)—normalization of sleep latency (if it was abnormal pre-treatment), and/or improvement/normalization of the MSLT
E	Epworth sleepiness scale—normalization to less than 10 (if it was abnormal pre-treatment), or a reduction by five points
E	Execution time—improvement by more than 50 %, using performance vigilance testing
P	Pressure (SBP)—(a) reduction in mean blood pressure by 7 mmHg, or (b) single reduction in either SBP or DBP by 10 mmHg or (c) 5 mmHg reduction in both
G	Gross weight/BMI—loss of >10 % gross weight, and/or reduction BMI from one category to another (by four points)
O	Oxygenation—improvement of duration (min) of O_2 <90 % by at least half
A	AHI via sleep study—reduction by 50 % and AHI <20
L	Life score (PSQI)—improvement in a relevant OSA related QOL score (i.e. PSQI or SF36 or FOSQ)

OSA – MDT approach







OSA – MDT approach

STANDARDS FOR ADULT RESPIRATORY AND SLEEP SERVICES IN NEW ZEALAND

A document produced for the Thoracic Society of Australia and New Zealand (New Zealand Branch)

Interaction with ORL services for upper airway assessment and when required, surgery, is mandatory.

OSA – MDT approach

AUSTRALASIAN SLEEP ASSOCIATION

114/30 Campbell Street
Blacktown NSW 2148
ABN: 51 138 032 014
Phone: 61 2 9920 1968
Fax: 61 2 9672 3884
email: admin@sleep.org.au
web: www.sleep.org.au

Australasian Sleep Association submission re. Adult Sleep Apnea Surgery

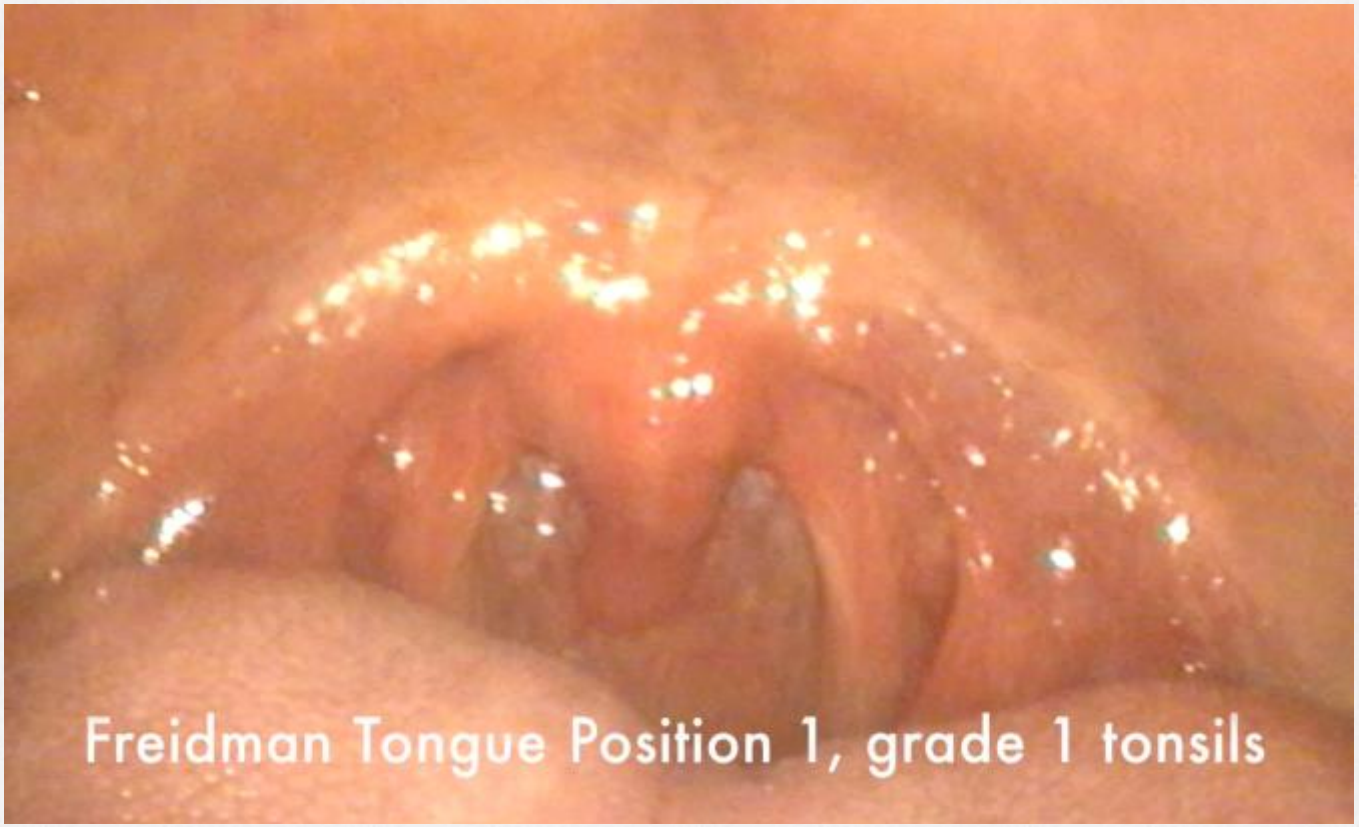
Surgery for OSA has a crucial role as "salvage therapy" in those who have failed OSA and Oral appliances

OSA – MDT approach

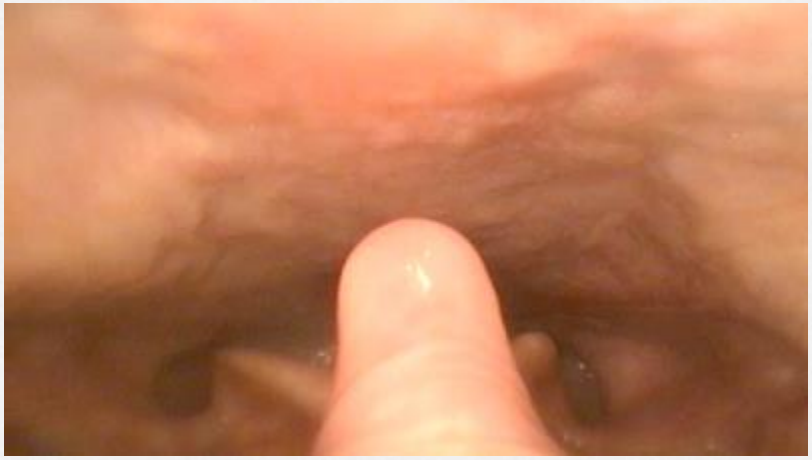
OSA - assessment

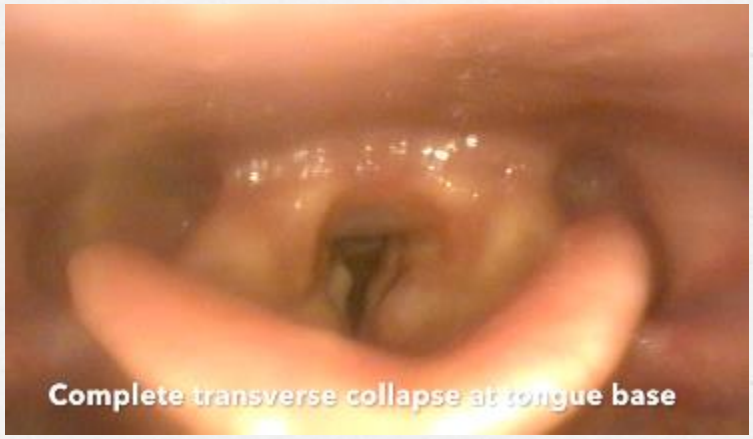
- Patient reported measures
  - Snoring, sleepiness, hygiene, QOL
- Vigilance testing
- Co-morbidities
- Dynamic upper airway assessment
  - Awake supine, DISE
- Cephalometry
- Sleep study

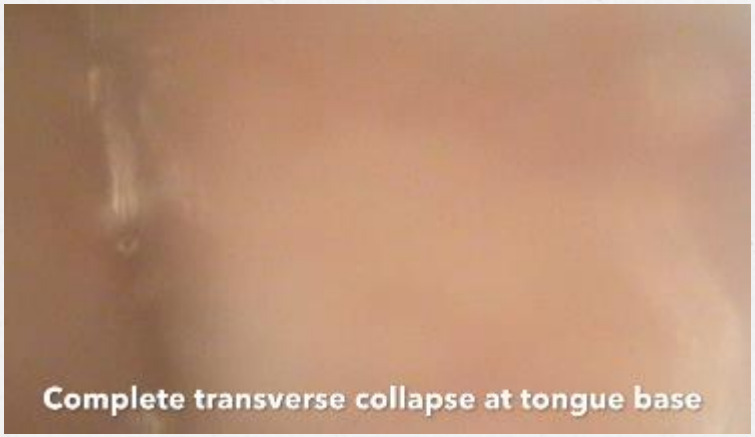
Upper airway dynamic assessment



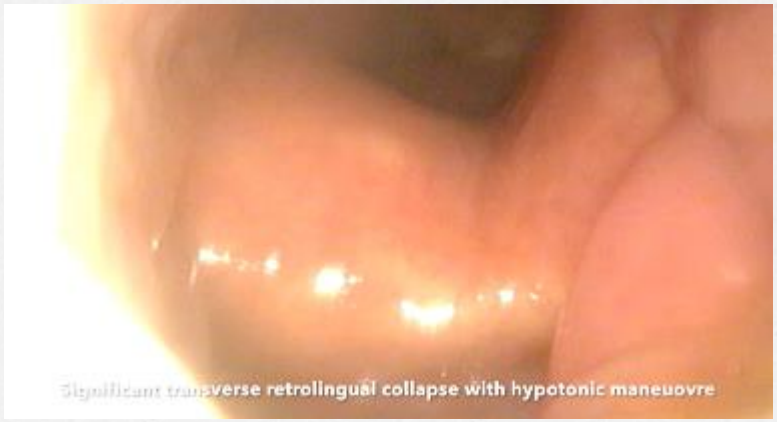
Upper airway dynamic assessment







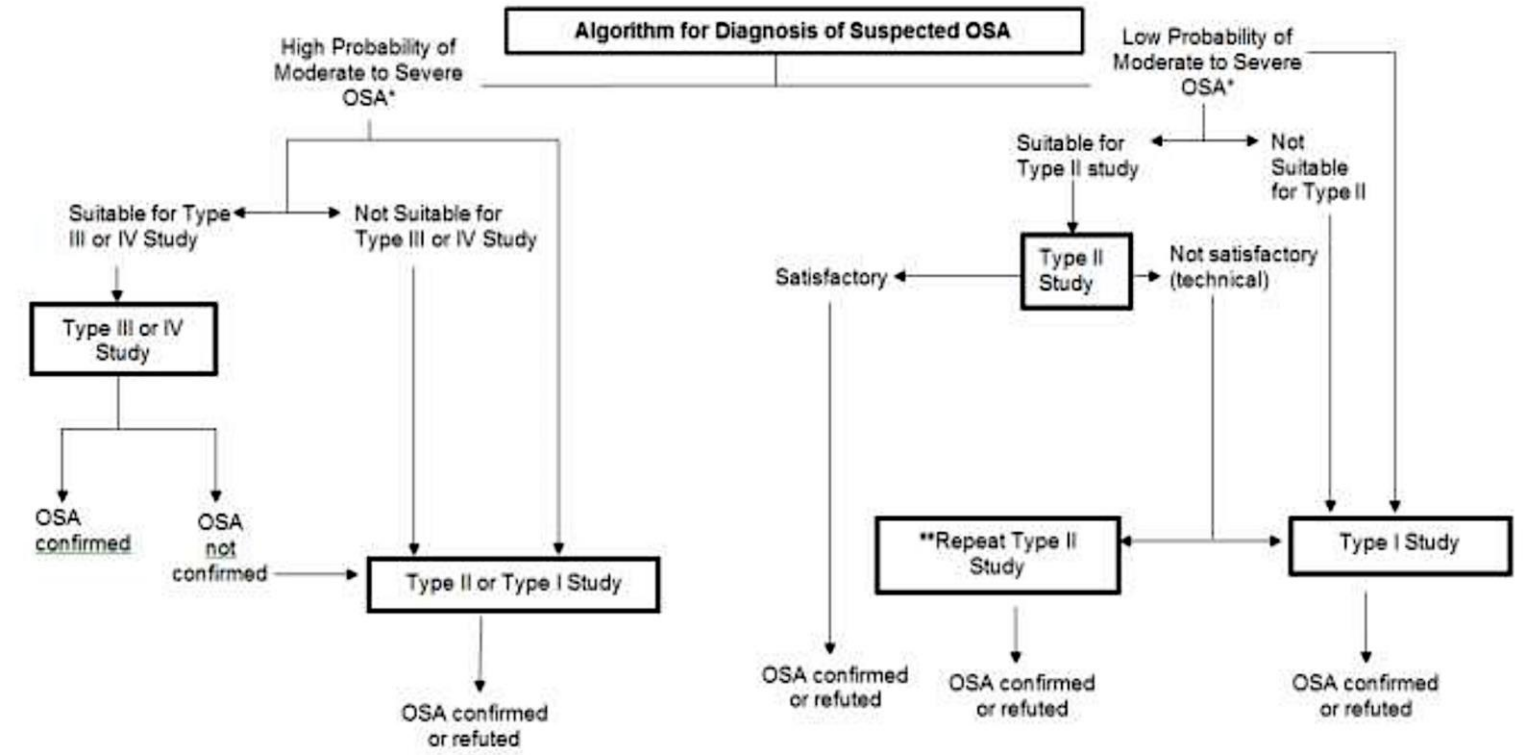
Upper airway dynamic assessment



OSA – sleep study

STUDY TYPE	PARAMETERS MONITORED
I	Minimum of 7 to include EEG, EOG, chin EMG, airflow, respiratory effort, oxygen saturations, and ECG. Attended by a sleep technician.
II	Minimum of 7 to include EEG, EOG, chin EMG, airflow, respiratory effort, oxygen saturations, and ECG. Unattended by a sleep technician.
III	Minimum of 4 channels to include ECG/HR, oxygen saturations, two channels of respiratory effort or one respiratory effort channel and one airflow channel. Attended or unattended by a sleep technician.
IV	Minimum of 3 channels, one of which is airflow or include actigraphy, oxygen saturations, and peripheral arterial tone. Attended or unattended by a sleep technician.

OSA – sleep study



Australasian Sleep Association

OSA – management

- Lifestyle measures
- Positional Training (PST)
- Positive Airway Pressure therapy (PAP)
- Mandibular Advancement Device (MAD)
- Surgery

OSA – lifestyle

- Quit smoking
- Regulate alcohol intake
- Sleep hygiene
- Sleep hygiene
- Sleep hygiene
- Weight loss
- Smart phone apps
  - Analytics → predictanalytics

OSA – PST

- Elbow
- Tennis ball therapy
- Night Shift
- Night Balance
- Smart phone apps

OSA – PAP

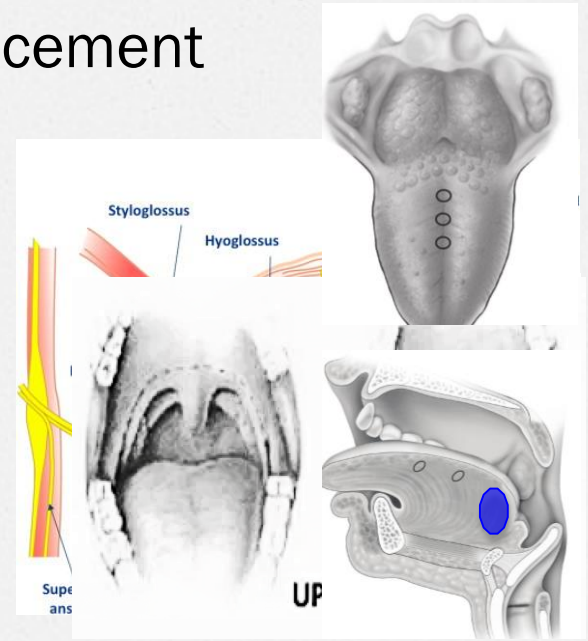
- 100% efficacy
- No pain
- Reversible
- 46-75% compliance
- Excessive daytime sleepiness motivates!

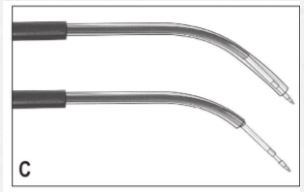
OSA – MAD

- Non-surgical
- Simpler option
- 60% effectiveness
- Expensive
- Dental and occlusion side effects

OSA – surgery

- Maxillary-mandibular advancement
- Bariatric surgery
- Oropharyngeal surgery
  - UPPP
  - Modified UPPP
  - Palatal advancement
  - Tongue Base reduction
  - Hyoid suspension
  - Hypoglossal nerve stimulation
  - Tracheostomy





OSA – outcomes

- AHI
- Oxygen desat index, lowest sats, time < 90%
- Excessive daytime sleepiness
- Vigilance test result
- Control of hypertension
- Insulin resistance and obesity
- Performance and productivity

Survival of veterans with sleep apnea: Continuous positive airway pressure versus surgery

EDWARD M. WEAVER, MD, MPH, CHARLES MAYNARD, PHD, and BEVAN YUEH, MD, MPH, Seattle, Washington

OBJECTIVES: Continuous positive airway pressure (CPAP) improves sleep apnea survival. We tested whether CPAP is associated with better survival than uvulopalatopharyngoplasty (UPPP).

STUDY DESIGN AND METHODS: This retrospective cohort database study included all sleep apnea patients treated with CPAP or UPPP in Veteran Affairs facilities from October 1997 through September 2001. Treatment groups were compared with Cox regression, adjusting for age, gender, race, year treatment was initiated, and comorbidity. Sleep apnea severity and CPAP use data were not available.

RESULTS: By September 2002, 1339 (7.1%) of 18,754 CPAP patients and 71 (3.4%) of 2,072 UPPP patients were dead ($P < 0.001$). After adjustment, CPAP patients had 31% (95% confidence interval, 3% to 67%, $P = 0.03$) higher probability of being dead at any time, relative to UPPP patients.

CONCLUSIONS: UPPP confers a survival advantage over CPAP, after adjustment for age, gender, race, year of treatment, and comorbidity. However, we were unable to adjust for sleep apnea severity or CPAP use. Surgical treatment should be considered in sleep apnea patients who use CPAP inadequately. (Otolaryngol Head Neck Surg 2004;130: 659-65.)

Untreated obstructive sleep apnea (OSA) appears

Sleep disordered breathing

ORIGINAL ARTICLE

SKUP[3] randomised controlled trial: polysomnographic results after uvulopalatopharyngoplasty in selected patients with obstructive sleep apnoea

Nanna Browaldh,[1] Pia Nerfeldt,[1] Michael Lysdahl,[2] Johan Bring,[3] Danielle Friberg[1]

[1] ORL Department, Karolinska University Hospital, Huddinge, Stockholm, Sweden; [2] Capio Ersta Hospital, Stockholm, Sweden; [3] Statistician AB, Uppsala, Sweden

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Received: 12 September 2012
Revised: 25 February 2013
Accepted: 3 April 2013
Published Online First: 5 May 2013

ABSTRACT

Objective To assess the 6-month efficacy of uvulopalatopharyngoplasty (UPPP) compared with expectancy in selected patients with obstructive sleep apnoea syndrome (OSAS).

Design A prospective single-centre randomised controlled trial with two parallel arms stratified by Friedman stage and body mass index (BMI).

Participants 65 consecutive patients with moderate to severe OSAS (apnoea–hypopnoea index (AHI) ≥15 events/h sleep), BMI <35 kg/m², Epworth sleepiness scale ≥8, Friedman stage I or II.

Intervention Surgical treatment with UPPP. The control group underwent UPPP after a delay of 6 months.

Outcomes Changes in AHI and other polysomnography parameters at baseline compared with the 6 month follow-up.

Results All patients (32 in the intervention group and 33 in the control group) completed the trial. The mean (SD) AHI in the intervention group decreased significantly (p<0.001) by 60% from 51.3 (19.7) events/h to 21.1 (16.7) events/h. In the control group the mean AHI decreased by 11% from 52.6 (21.1) events/h to 46.8 (22.8) events/h, with a significant difference between the groups (p<0.001). The mean time in the supine position and the BMI were unchanged in both groups. Subgroup analyses for Friedman stage, BMI group and tonsil size all showed significant reductions in AHI in the intervention group compared with controls. There were no severe complications after surgery.

Conclusions This trial demonstrates the efficacy of UPPP in treating selected patients with OSAS with a mean reduction in AHI of 60% compared with 11% in controls, a highly significant and clinically relevant difference between the groups.

Trial registration number NCT01039871.

Key messages

What is the key question?

- Are the respiratory events during sleep (apnoea–hypopnoea index, AHI) significantly reduced in selected patients with OSAS treated with UPPP (plus tonsillectomy) compared with expectancy for 6 months?

What is the bottom line?

- This study shows a highly significant and clinically relevant difference in AHI reduction in favour of UPPP compared with expectancy.

Why read on?

- This is the first randomised controlled trial of UPPP in patients with OSAS to evaluate AHI with in-laboratory polysomnography. Subgroup analyses showed that patients with small tonsils also benefit from surgery.

unselected patients with OSAS worldwide before continuous positive airway pressure (CPAP) devices became widely available in the 1990s. Since then, the main treatment for OSAS has been CPAP, but an increasing number of patients are also treated with a mandibular retaining device (MRD). CPAP treatment is successful when fully accepted and used by the patient. However, studies show that approximately 29–83% of patients are non-adherent to CPAP treatment for more than 4 h a night,[2] and that the median compliance rate is approximately 50–75% after 1–3 years.[3 4] Also, for MRD treatment, the compliance rate is moderate at about 56% after 3 years.[5]

The role of UPPP has been questioned because of

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SKUP[3] RCT; Continuous Study: Changes in Sleepiness and Quality of Life After Modified UPPP

Nanna Browaldh, MD, PhD; Johan Bring, PhD; Danielle Friberg, MD, PhD

Objectives/Hypothesis: Our previous study showed that modified uvulopalatopharyngoplasty (UPPP), including tonsillectomy, significantly improved nocturnal respiration in obstructive sleep apnea syndrome (OSAS) patients. This is a continuous study of changes in daytime sleepiness and quality of life.

Study Design: Prospective randomized controlled trial (RCT), two parallel arms.

Methods: Sixty-five patients with apnea-hypopnea index > 15, body mass index < 36, Epworth Sleepiness Scale (ESS) ≥ 8, Friedman stage I or II, failing nonsurgical treatment. The intervention group (n = 32) underwent surgery, and the controls (n = 33) had no treatment. At baseline and the 7-month follow-up, polysomnography, questionnaires, and vigilance tests were implemented.

Results: All patients answered the questionnaires, and 48 took the vigilance test. Epworth Sleepiness Scale decreased significantly in the intervention group, from a mean (standard deviation) of 12.5(3.2) to 6.8(3.9), but nonsignificantly in the control group, from 12.9(3.1) to 12.5(3.9), a significant group difference ($P < 0.001$). The physical and mental component scores on the Short Form-36 questionnaire increased significantly in the intervention group, from a mean 47.8(8.3) to 51.2(8.8) and from 42.1(10.6) to 48.1(9.7), respectively, but with nonsignificant changes in the controls: 49.0(9.0) to 48.3(9.1) and 41.0(10.2) to 42.7(11.5), significant group differences ($P = 0.007$, $P = 0.031$), respectively. The sleep latency/vigilance test showed a significant mean increase in the intervention group of 7[12.4] minutes and a decrease in the controls of 2.2[10.6], a significant group difference ($P = 0.011$). There were significant correlations between changes in subjective outcomes and nocturnal respiration.

Conclusion: This RCT shows that modified UPPP was effective in improving daytime sleepiness and quality of life in OSAS patients. It strengthens the body of evidence on the potential effect of surgery offered to selected patients.

Key Words: Obstructive sleep apnea syndrome, Short Form-36, quality of life, uvulopalatopharyngoplasty, randomized controlled trial, sleepiness.

Level of Evidence: 1b.

Laryngoscope, 126:1484–1491, 2016

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SKUP[3]: 6 and 24 Months Follow-up of Changes in Respiration and Sleepiness After Modified UPPP

Nanna Browaldh, MD, PhD; Johan Bring; Danielle Friberg, MD, PhD

Objective: Our previous randomized controlled trial of patients with obstructive sleep apnea syndrome (OSAS) showed that modified uvulopalatopharyngoplasty (UPPP), including tonsillectomy, significantly improved nocturnal respiration, daytime sleepiness, and quality of life in the intervention group compared to controls who had delayed surgery after 6 months. This is the continuous report with the 6- and 24-month postoperative results.

Study Design: Single-center prospective cohort study.

Methods: Sixty-five patients with apnea–hypopnea index (AHI) ≥ 15, body mass index (BMI) < 36, Epworth Sleepiness Scale (ESS) ≥ 8, and Friedman stage I or II underwent UPPP after failing nonsurgical treatment. The results from polysomnography and ESS at 6 and 24 months were compared to baseline.

Results: Eight percent and 20% dropped out from the 6- and 24-month follow-ups, respectively. The AHI value decreased significantly from mean (standard deviation) 52.9 (20.5) at baseline to 23.6 (20.2) after 6 months, and to 24.1 [20.9] after 24 months ($P < 0.001$). Patients with tonsil size 2, and 3 to 4, had significant reductions in the AHI after both follow-ups. The median ESS score decreased significantly from 13 (range 8–21) to 6.5 (1–18) after 6 months, and to 5 (2–17) after 24 months ($P < 0.001$). The BMI remained unchanged. There were significant modest correlations for the reductions in AHI and ESS after 24 months.

Conclusion: Modified UPPP was effective in improving nocturnal respiration and daytime sleepiness in OSAS patients at both 6- and 24-month follow-up. Patients with tonsil size 2, and 3 to 4, benefitted similarly from surgery with improved respiration.

Key Words: Obstructive sleep apnea syndrome, Epworth sleepiness scale, uvulopalatopharyngoplasty, daytime sleepiness.

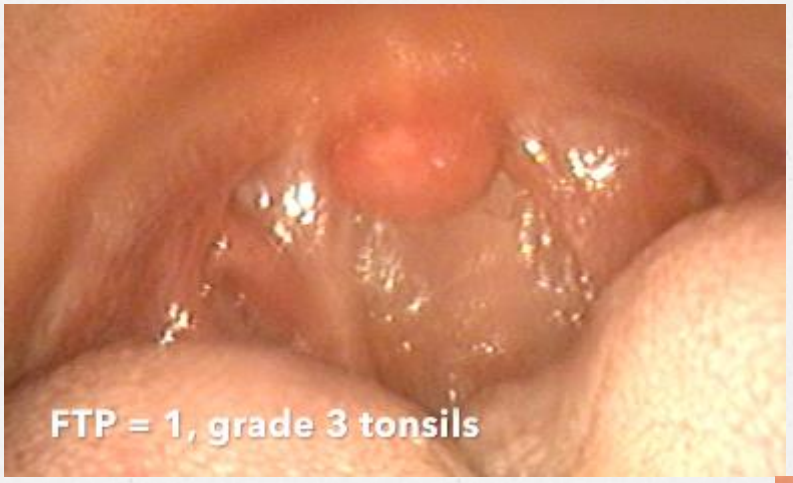
Level of Evidence: 2b.

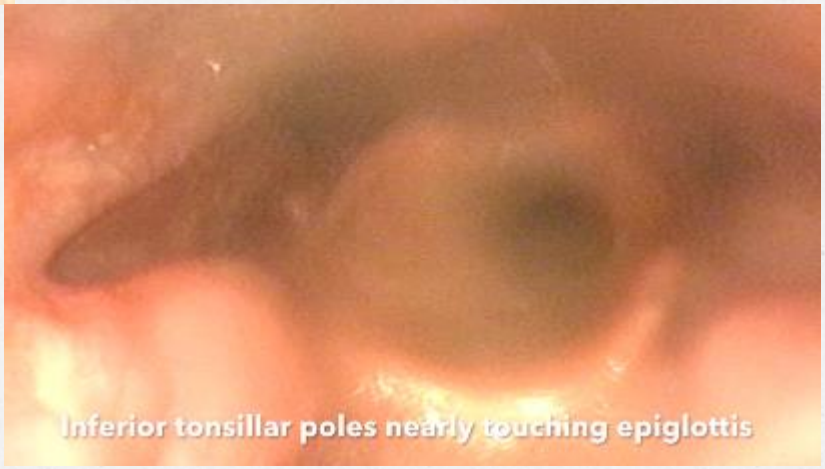
Laryngoscope, 128:1238–1244, 2018

OSA – outlook

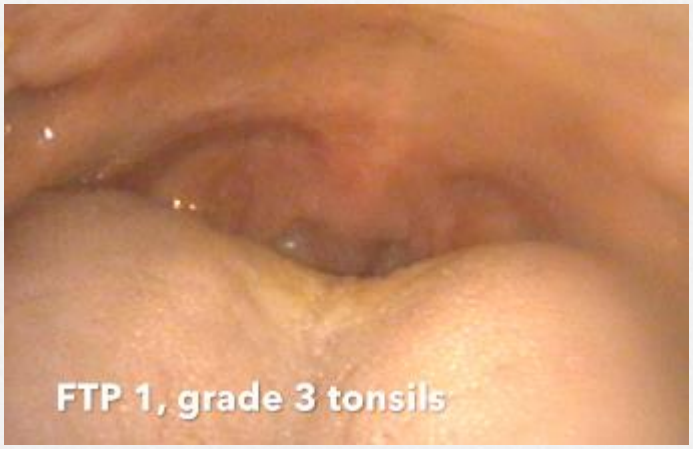
- What is the best cure for OSA?
- How do we control it best?
- Success depends on parameter studied
- Personalised management
- *Friends for life!*

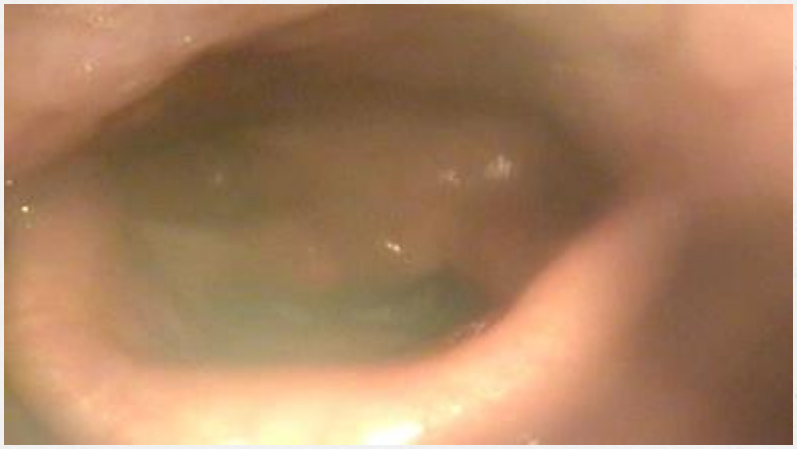
Case 1

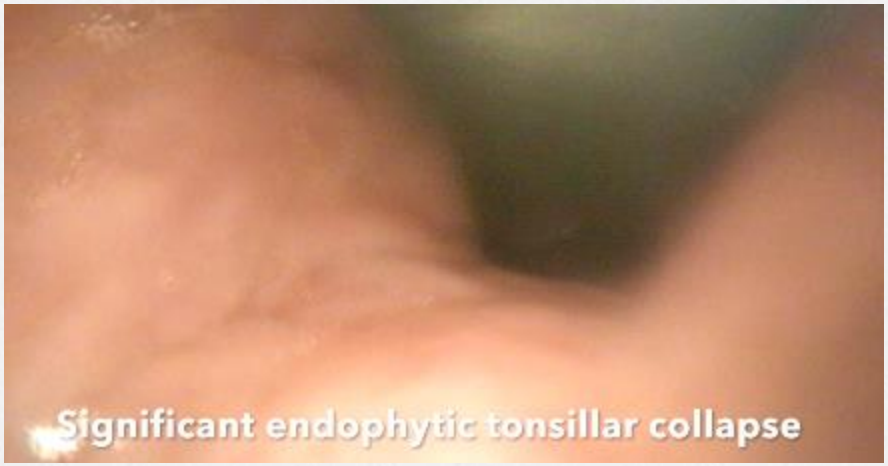

FTP = 1, grade 3 tonsils


Inferior tonsillar poles nearly touching epiglottis

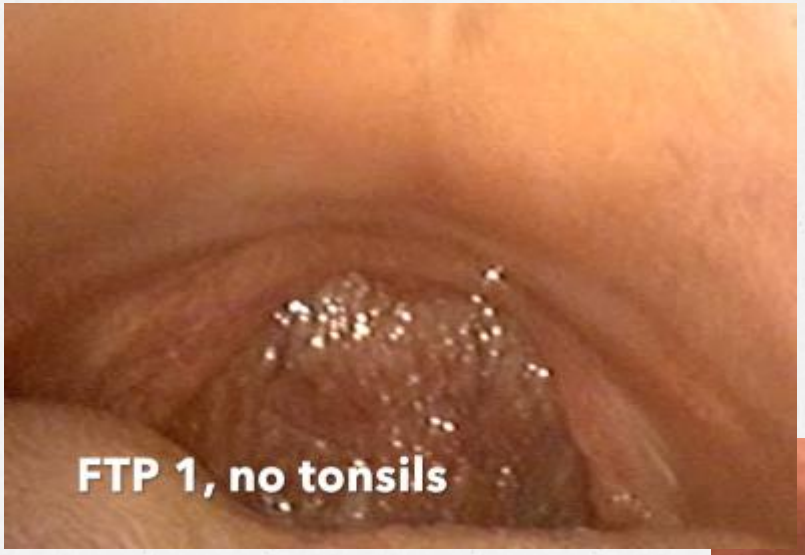
Case 2

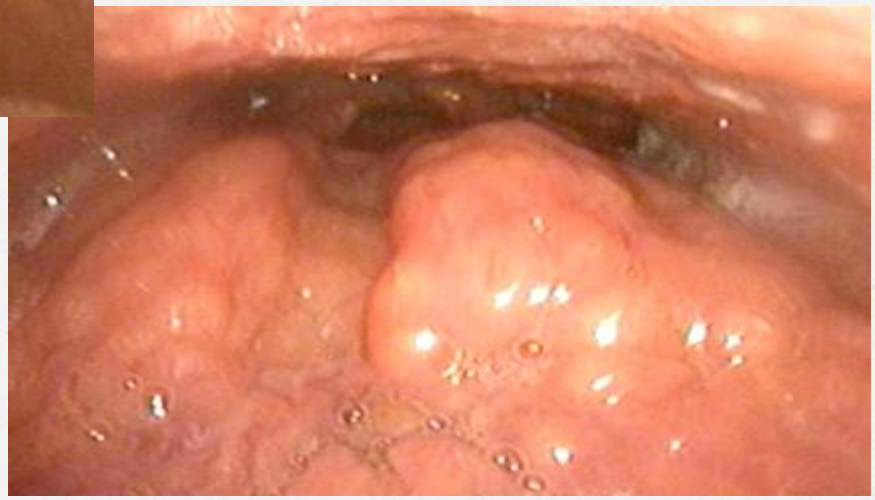

FTP 1, grade 3 tonsils




Significant endophytic tonsillar collapse

Case 3





Questions?

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