Logistics and Relevance of Drug Induced Sleep Endoscopy

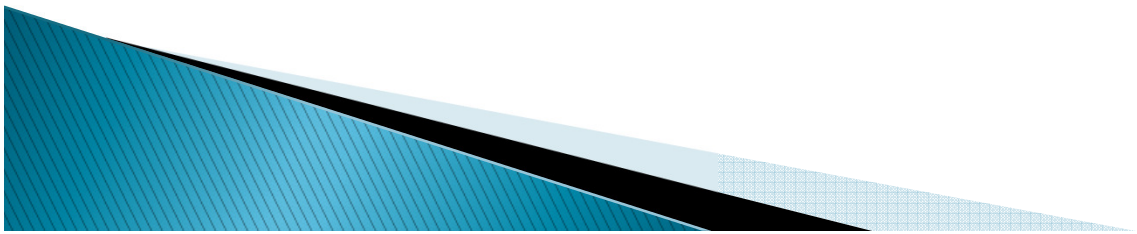
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Disclosure

X	No, nothing to disclose
x	

Amsterdam

- >2000 sleep studies
- > 600 sleep endoscopies (DISE)
- Focused on 1 day
- 8 DISE in the morning, 8 in the afternoon
- Chin lift, head rotation
- 200 sleep surgeries



Logistics /organisation

- ENT Staff member vs resident
- Anesthesiologist vs nurse practitioner
- OR vs day care facility
- Discussion outcome on the same day ?
- Endoscopist and responsible doctor the same?

Methods of DISE

VOTE classification

	DIRECTION		
LEVEL	A-P	LATERAL	CONCENTRIC
Velum			
Oropharynx			
Tongue Base			
Epiglottis			

Kezirian EJ, Hohenhorst W, de Vries N. Drug-induced sleep endoscopy: the VOTE classification. Eur Arch Otorhinolaryngol 2011Aug;268(8):1233-6. Epub 2011 May 26.

Hohenhorst W, Ravesloot MJL, Kezirian EJ, de Vries N. Drug-Induced Sleep Endoscopy in adults with Sleep Disordered Breathing: Technique and the VOTE Classification System. Operative Techniques in Otolaryngology-Head and Neck Surgery, Epub 2012 23,3-10

- Supine, left, right, head tilt to left and right, with or without chinlift.
- If PT is part of the treatment, it makes more sense to perform DISE in lateral position than in supine position.

	DIRECTION		
LEVEL	a-p	lateral	concentric
Velum	2	0	0
Oropharynx, tonsils		1	0
Tongue Base	0		
Epiglottis	2	0	

After chinlift

	DIRECTION		
LEVEL	a-p	lateral	concentric
Velum	0	0	0
Oropharynx, tonsils		0	0
Tongue Base	0		
Epiglottis	0	0	

Positional OSA (POSA) and DISE

- If Positional Therapy is considered as part of the treatment DISE should be performed in lateral (head) position as well.
- DISE in lateral position shows less severe obstruction.
- L and R are the same.

[UPPER AIRWAY COLLAPSE DURING DISE: HEAD ROTATION IN SUPINE POSITION COMPARED WITH LATERAL HEAD AND TRUNK POSITION.
Safiruddin F, Koutsourelakis Y, de Vries N.
Eur Arch Otorhinolaryngol. 2014 Aug 21.

100 consecutive patients undergoing DISE
Results and Evaluation

M.J.L. Ravesloot, N. de Vries
Laryngoscope 2011;212(12):2710-6.

Demographics

- 100 patients
- 80% male

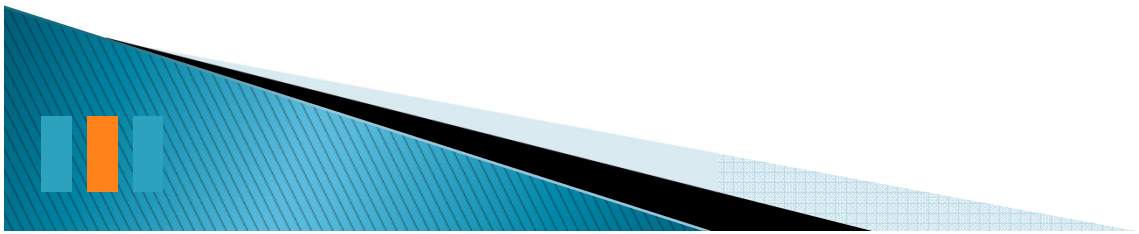
- 18% no OSA
  82% OSA

- 52% positional OSA

	mean	*SD*
Age	46,7	11,5
AHI	21,3	18,2
AI	11,2	14,5
BMI	27,4	4,1
Supine AHI	35,7	26,1
Average O_2	94,6%	1,9
Minimum O_2	84,3%	6,6%
DI	10	13,6

Results

- 75% multi-level obstruction
- 24% uni-level obstruction
- 1% no obstruction (snoring)



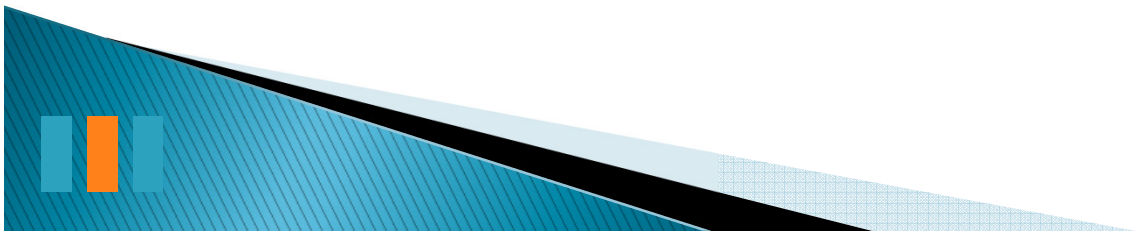
Results

- Distribution of site and pattern of obstruction

	Direction					
Level	A-P		Lateral		Concentric	
	partial	complete	partial	complete	partial	complete
Velum	38%	20%	1%	4%	10%	10%
Oropharynx			3%	1%	1%	2%
Tongue Base	27%	29%				
Epiglottis	12%	16%	2%	8%		

Results

- Association DISE observations with AHI/BMI
- Association uni/multi-level obstruction with AHI
- Association DISE observations with positional OSA (POSA)



Association complete concentric collapse of the soft palate with AHI/BMI

- Complete concentric collapse of the soft palate → higher AHI
  - p=.041



- Complete concentric collapse of the soft palate → higher BMI
  - p=<.001

Association tongue-based collapse with AHI/BMI

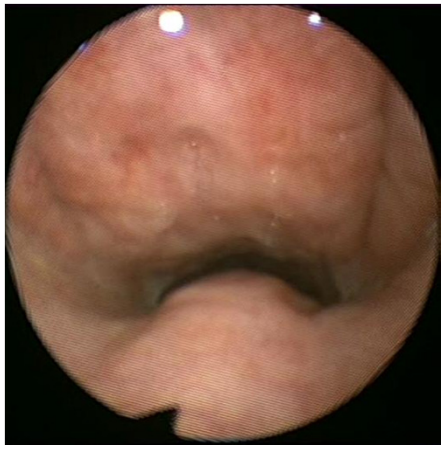
- Tongue-based collapse
  → higher AHI
  - p=.01

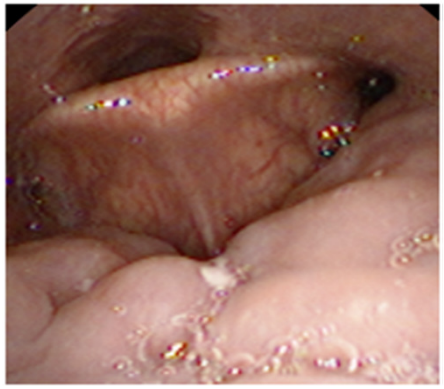
- Tongue-based collapse
  → lower BMI
  - p=.054



Association uni/multi-level obstruction with AHI

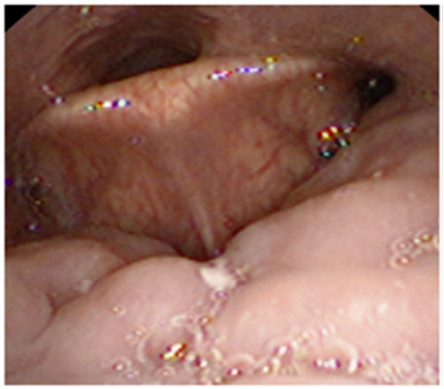
- Multi-level obstruction
  → higher AHI
  - p=.007





Association patient characteristics with positional OSA

- Epiglottal or tongue base collapse
  → positional OSA





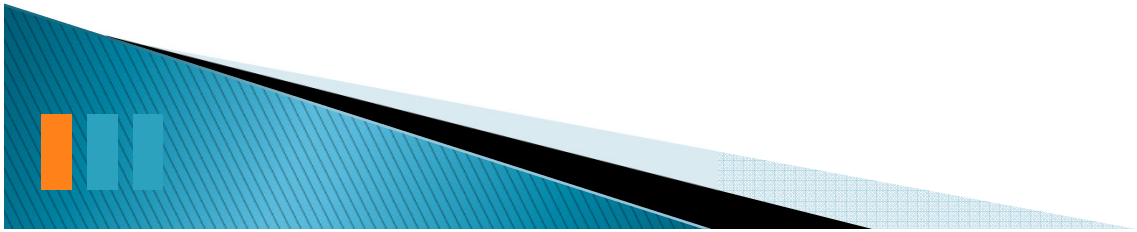
Correlation with surgical outcome

- Predict surgical outcome by investigating DISE findings/ results
- Hypothesis
  - Level, type and severity of collapse could predict the surgical outcome

Koutsourelakis I, Safiruddin F, Ravesloot MJL, Zakynthinos S, de Vries N. Laryngoscope. 2012 Aug 1. doi: 10.1002/lary.23462.

Upper airway surgery

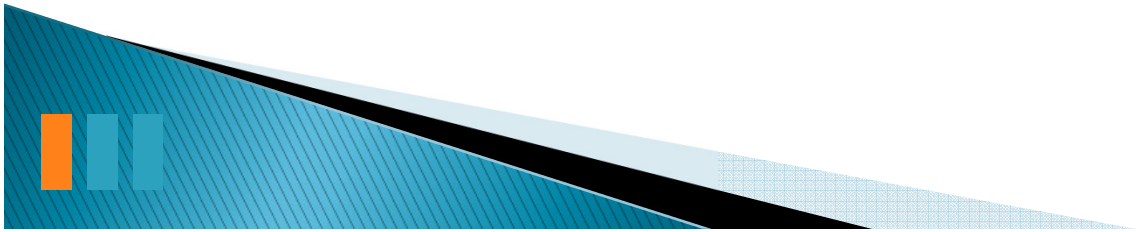
- UPPP *or* ZPP *and/or*
- Radiofrequency ablation of tongue base *and/or*
- Hyoid suspension



Outcome definition

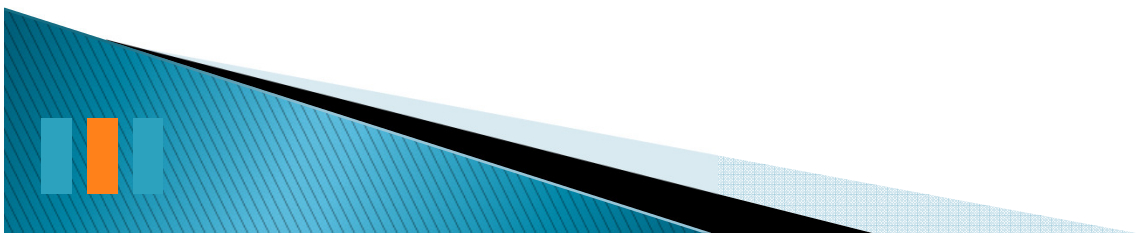
- Responders
  - Surgery success defined as a postoperative AHI < 10 along with at least 50% decrease from the baseline

- Non-responders
  - Treatment failure defined as a postoperative AHI >10 and/or a decrease of AHI from baseline less than 50%



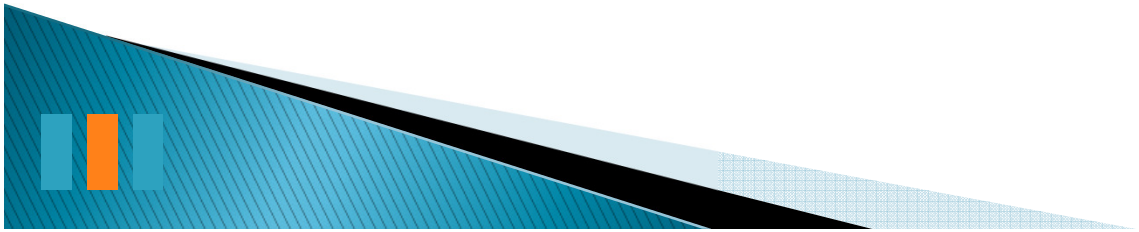
Results

- Responders: 23 patients (47%)
  - Post-operative difference AHI 26.0±19.4
- Non-responders: 26 patients (53%)
  - Post-operative difference AHI -1.8±14.8



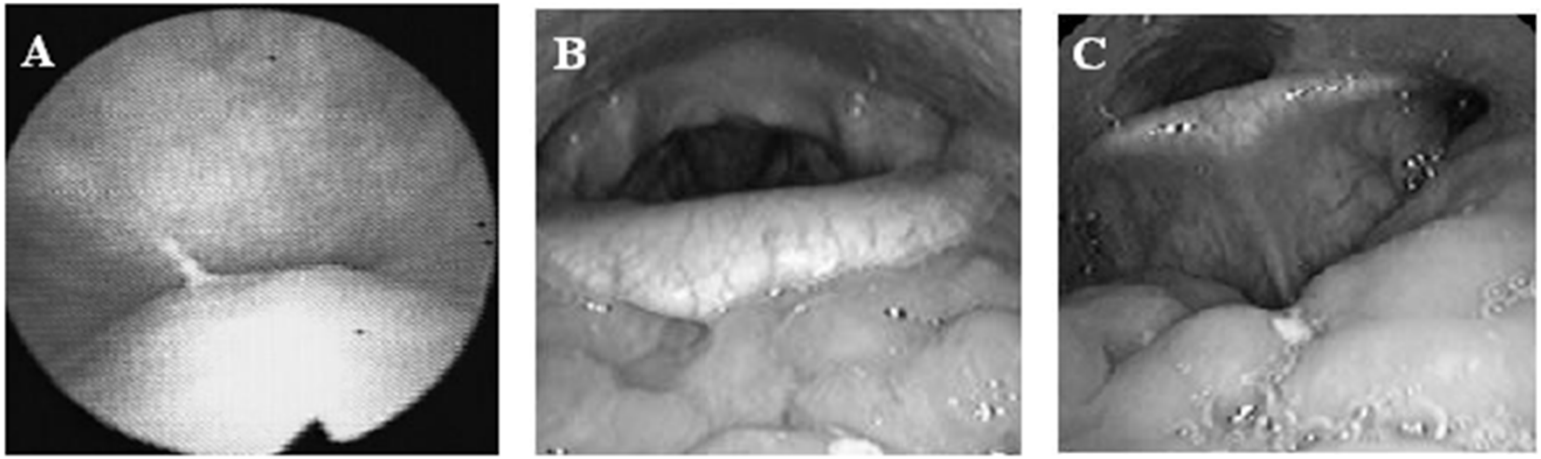
Results

- Responders
  - Higher occurrence of complete or partial A-P collapse at velum
  - Higher occurrence of partial A-P collapse at tongue base and epiglottis
- Non-responders
  - Higher occurrence of complete or partial concentric collapse at velum
  - Higher occurrence of complete A-P collapse at tongue base or epiglottis



Patterns of collapse on DISE

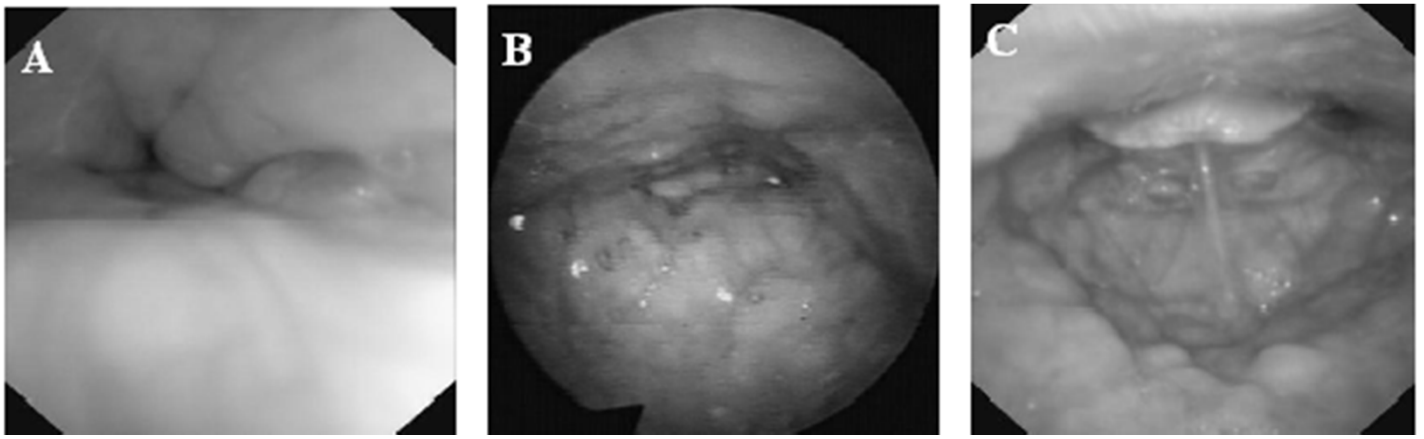
- Responders



A = complete AP collapse at velum
B = partial AP collapse at tongue base
C = partial AP collapse at epiglottis

Patterns of collapse

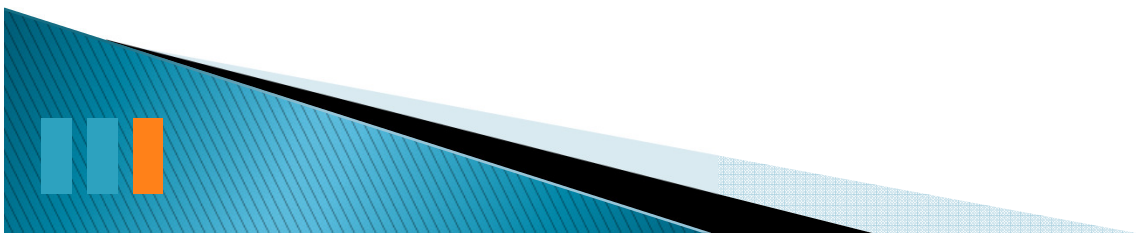
- Non-responders



A = complete circumferential collapse at velum
B = complete AP collapse at tongue base
C = complete AP collapse at epiglottis

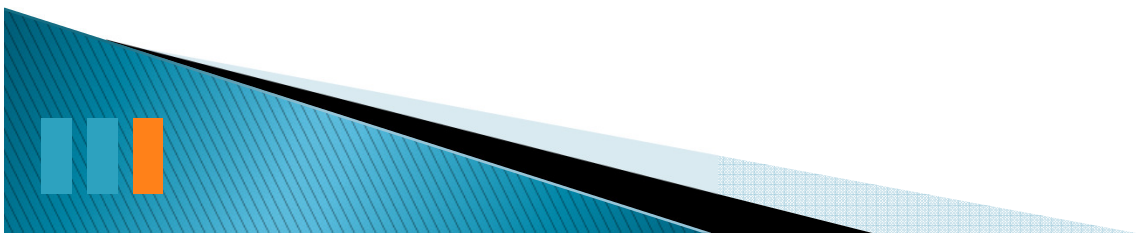
Conclusion

- DISE can be used to predict higher likelihood of response to upper airway surgery in OSA
- Larger scale study needed



Future

- Larger scale study under way
  - 635 DISE
  - Confirmation of previous results
  - No complications
  - Reliable, very small interindividual variation



Logistics /organisation

- DISE by ENT resident is safe and feasible
- DISE by anesthesia nurse practitioner is safe
- DISE in a day care facility is safe
- Outcome can be discussed on the same day
- Endoscopist and responsible doctor do not have to be the person, experienced

- Big data >> prediction of treatment outcome

- Thank you
- (shukran jazīlan) شكرا جزيل