



# Drug Induced Sleep Endoscopy, Our Experience



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## Introduction

Drug Induced Sleep Endoscopy (DISE) is an important hub in diagnostic pathway of patients affected by Obstructive Sleep Apnea Syndrome (OSA) providing useful information that can be useful for all the different professionals involved in this patient's management involving surgical or medical [1,2] decisions such as determining the exact anatomical structure involved in obstruction. During the procedure can be performed different test that can predict efficacy of different treatments such as mandibular advancements, hypoglossal stimulation and Mandibular advancement device fitting test that can further improve therapy addressing and surgical planning [3]. Knowing the anatomical site involved and the obstruction mechanism can lead to minimize the effort and combining multiple therapeutic approaches to maximize results and minimize side effects. Now there is no standard consensus on which classification to adopt and regional consensus as European Position Paper on DISE [4] are still not universally applied, therefore there are no Italian data on the most common obstruction pattern on a large population sample.

## Methods

In this retrospective study we evaluated 286 consecutive DISE reports from January 2015 to June 2018 from the Sleep department in Policlinico Gemelli Hospital. All patients underwent our clinics standard diagnostic pathway: otolaryngology pre-operative evaluation comprehensive of fibre optic nasopharyngoscopy with Muller's maneuver and Sleep medicine evaluation by objective items as home respiratory polygraphy (Somntè Recording Unit©,

Somntè Compumedics Australia), BMI, neck circumference

and a neurological exam, and Subjective evaluation. Subjective evaluation was obtained by means of Italian translation of strongly validated questionnaires named Sino-Nasal Outcome Test (SNOT-20), sleepiness through Epworth Sleepiness Scale (ESS) and Berlin questionnaire [5]. During the same surgery session, all patients underwent DISE and inferior turbinates decongestion, Anaesthesiologist, Neuroelectrophysiology Technician and Otorhinolaryngologic were attending the procedures.

Patients, already prepared for polygraphic intraoperative recording, received drug sedation. For drug sedation we used increasing dose of Propofol (3mg/kg/h) until continuous Bispectral Index (BIS) monitoring by Aspect A-2000 BIS monitor© (Aspect Medical Systems, Natick, MA), was between 45-65. During snoring, we use flexible nasopharyngoscopy trough the nasal cavity evaluating the pattern and degree of obstruction (nasopharynx, oropharynx hypopharynx and larynx) and continuously monitoring the sleep through polygraph (Somntè Compumedics System©, Somntè Compumedics Australia). We also performed a bimanual pull up mandibular advancement maneuver, advancing at 75% maximum confort advancements (4 to 5mm), evaluating masseter muscle activation and visualizing the effect on airway obstruction. The anatomical site and the magnitude of the obstruction are classified following a modified version of the classification proposed by Vicini [6]. At the end of DISE procedure all patients underwent Inferior turbinates decongestion to improve CPAP compliance [7-9].

**Table 1:** Modified vicini classification.

Site	Retropalatal- Space	Retro Lingual-Space	Hypopharynx	Larynx
Obstruction grade: (0%, 25%, 50%, 75%, 100%)				
Pattern (AP: anteroposterior, LL: latero-lateral, C: circonfential)				

The classification was compiled as shown in Table 1, it was also specified in case of laryngeal obstruction the mechanism of obstruction as trap-door closing of epiglottis, vocal folds spasm or edema. All procedures were made by the same operators and all the reports were reviewed by the same investigators.

## Results

The most common obstruction site is retropalatal space, most frequently completely: 100% in 83.4% cases (236/286), 75% in 11% (31/286), 50% in 3.5% cases (10/286) 25% in 0.7% (2/286) e 0% in 1.4% (4/286). The most common obstruction pattern of this site was concentrically (72.4% cases, 202/279) then antero-posterior (25.1%, 70/279) and lateral (2.5% 7/279). The following was retro-lingual space 100% in 24.3% cases (68/286), 75% in 23.9% (67/286), 50% in 24.6% cases (69/286) 25% in 15% (42/286) e 0% in 12.1% (34/286). The two most frequent patterns are antero-posterior 40.7% (100/246) and circumferential 40.2% (99/246), lateral pattern is less common 19.1% (47/246).

Hypopharynx was less involved: 100% in 1.4% cases (4/286), 75% in 3.1% (9/286), 50% in 1.4% cases (4/286) 25% in 1% (3/286) e 0% in 93.0% (266/286). The obstruction is mostly circumferential 60% (12/20), then lateral 35% (7/20), less common antero-posterior 5% (1/20). Larynx was involved at 100% in 5.9% cases (17/286), 75% in 1.7% (5/286), 50% in 1.7% cases (5/286) 25% in 1.7% (5/286) e 0% in 88.8% (254/286), the majority is anteroposterior 71.9% with a trap-door movement of the epiglottis (23/32), some are lateral for the closure of vocal folds 21.9% (7/32) or circumferential 6.3% (2/32).

Combined obstruction is frequent retropalatal and retro-lingual 87.5% of patient with retropalatal obstruction (244/279) while only 7.2% (10/279) had involved also Hypopharynx, and 11.5% (32/279) Larynx. Of the 32 patients whose Larynx was involved 53.1% (17/32) had an Hypopharyngeal association.

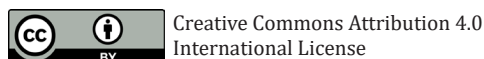
## Conclusion

Due to lack of consensus about DISE classification and the absence of large literature samples it is difficult to confront our data with literature. It is remarkable that cranial obstructions are

far more frequent than caudal obstructions and frequently more complete, also the most frequent obstruction is a circumferential retropalatal obstruction and that can be a strong point in proposing mandibular advancement, Laryngeal and Hypopharyngeal are associated in 53% cases. Knowing the site of obstruction can lead to a better therapeutic planning in OSA patients aiming the best and less invasive surgical procedure thus combining surgery with other approaches such as Mandibular Advancement devices, Positional therapy or electrostimulation.

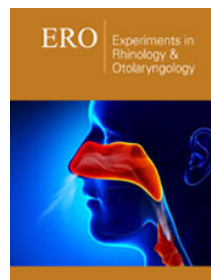
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