

Drug-Induced Sleep Endoscopy

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KEYWORDS

• Obstructive sleep apnea • Drug-induced sleep endoscopy • Snoring • Surgery

KEY POINTS

- Drug-induced sleep endoscopy (DISE) is an upper airway evaluation technique with 3 key features: the use of pharmacologic agents to achieve sedation, the target depth of sedation as approximating natural sleep as much as possible, and the endoscopic evaluation of the upper airway.
- The VOTE Classification incorporates the 4 major structures that contribute to airway obstruction in most patients: Velum (palate), Oropharyngeal lateral walls, Tongue, and Epiglottis.
- DISE may improve treatment selection in sleep-disordered breathing, especially in patients with obstructive sleep apnea unable to tolerate positive airway pressure therapy.

INTRODUCTION

Because up to 50% of patients with obstructive sleep apnea (OSA) are unable to tolerate positive airway pressure therapy,¹ alternative treatments, such as surgery, upper airway stimulation, or oral appliances, may be required. Comprehensive patient evaluation is a key to success for the latter group of treatments. The goal of evaluation is to determine the pattern of airway obstruction, with the ultimate aim of designing targeted, effective treatment.

The ideal evaluation technique would be an assessment of breathing, sleeping patients, as this would provide a real-time, dynamic assessment. It would also be safe, noninvasive, and low cost. The desire to directly visualize airway obstruction led some investigators to perform fiberoptic examination during natural sleep in the late 1970s and early 1980s.^{2,3} However, these efforts were generally abandoned due to the

Disclosures: None.

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Otolaryngol Clin N Am ■ (2016) ■-■
<http://dx.doi.org/10.1016/j.otc.2016.06.002>

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Abbreviations

DISE Drug-induced sleep endoscopy

OSA Obstructive sleep apnea

discomfort experience by patients, particularly with movement of the endoscope to view multiple areas of the pharyngeal airway.

Fiberoptic evaluation of the upper airway under conditions of sedation was developed in a number of centers in Europe in the late 1980s, and Croft and Pringle⁴ first described their technique of “sleep nasendoscopy” in 1991. The nomenclature was changed to “drug-induced sleep endoscopy” (DISE) by Kezirian and Hohenhorst (W. Hohenhorst, personal communication, 2005) to reflect the 3 key features of this method: the potential use of various pharmacologic agents to achieve sedation, the target depth of sedation as approximating natural sleep as much as possible, and the endoscopic evaluation of the upper airway. In contrast to other procedures that usually provide 2-dimensional assessments during wakefulness in the upright sitting position, DISE provides a 3-dimensional evaluation of the airway during unconscious sedation.

This article presents recommendations regarding DISE technique and reviews the evidence concerning the role of DISE in the evaluation of OSA.

TECHNIQUE***Indications/Contraindications***

Any diagnostic evaluation will be useful if the benefits outweigh the risks. For DISE, the benefits include potential value in treatment selection, and the risks are related to the sedative agent used and the potential for significant airway compromise. Indications and contraindications are listed in **Box 1**.

Sedative Agent

Control of the depth of sedation is essential. The sedative agent will generally be administered intravenously at the minimum dose to achieve the target depth of sedation: the loss of consciousness, defined as loss of response to verbal stimulation at a

Box 1**Indication and contraindication for drug-induced sleep endoscopy***Indications*

Patients with obstructive sleep apnea (OSA) (or snoring, in some countries)

Unable to tolerate positive airway pressure (in countries in which positive airway pressure is the first-line treatment modality for OSA)

Consideration of surgery, oral appliances, positional therapy, or combination approaches

Contraindications (relative)

Allergy to sedative agents

Pregnancy

Significant medical comorbidities

Optional contraindications used by some surgeons:

Markedly severe OSA (AHI >70 events per hour)

Obesity (body mass index >35 kg/m²)

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