ABSTRACT

Objective: To describe a method for performing drug-induced sleep endoscopy on severe sleep apnea patients, utilizing a rapid titration of propofol with real-time calculation of maintenance dose infusions to quickly reach and maintain a goal of moderate airway obstruction.

Study Design: Case series

Methods: Sleep apnea patients undergoing initial screening for possible surgical intervention via transoral robotic surgery were taken to the operating room for sleep endoscopy as part of a prospective trial. The patients were induced with a novel propofol infusion sequence, which was rapidly titrated to an endpoint level of sedation producing moderate obstruction, based on computer modeling performed in real-time. Standard intraoperative monitoring parameters were recorded and analyzed.

Results: In this series, 17 patients underwent sleep endoscopy. Each achieved sedation with a propofol infusion rate calculated in real-time by a software program and targeted to a specific clinical effect. 16/17 patients completed the endoscopy without a chin lift or jaw thrust performed to correct complete obstruction. The procedure allowed an assessment of the anatomic location of obstruction in all patients.

Conclusion: Titration of propofol to precise pharmacodynamic endpoints with software utilizing a pharmacokinetic model shows promise in simplifying and standardizing the challenging task of inducing and maintaining airway obstruction during sleep endoscopy, while making an accurate assessment of the location of obstruction in sleep apnea patients.

INTRODUCTION

Sleep endoscopy is performed on patients with obstructive sleep apnea to evaluate and diagnose the anatomic location of obstruction. This assessment can help tailor treatments to the individual patient. Sleep endoscopy is typically performed in the operating room with anesthesia to create a loss of consciousness and relaxation of pharyngeal tone. The ability to reliably achieve and maintain a moderate level of airway obstruction during the evaluation can be challenging.

Overshooting the desired goal, creating total obstruction and hypoxia, is common. If ancillary airway measures such as bag ventilation, or oral/nasal airways are utilized, the evaluation is disrupted and identifying the anatomic location of obstruction is difficult or impossible. Therefore, it is advantageous to develop a standardized system of delivering anesthetic to reliably, accurately, and quickly create obstruction under or over-shooting.