CASE REPORT

The Upper Airway Resistance Syndrome Masquerading as Nocturnal Asthma and Successfully Treated with an Oral Appliance

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ABSTRACT

Over the past 10 years, our ability to recognize, treat, and identify the morbidity associated with the upper airway resistance syndrome (UARS) has improved vastly. The diagnosis of this syndrome is dependent on a high degree of clinical suspicion, and in the presence of an already known pulmonary disease such as asthma, the identification of UARS may be elusive. Treatment of this condition has received more recent attention in the literature, with oral appliance therapy as a viable treatment option in place of the usual positive-pressure ventilation devices.

KEYWORDS: Upper airway resistance syndrome, oral appliance, obstructive sleep apnea, asthma, continuous positive pressure ventilation, sleep disorder

First coined in 1993, the term upper airway resistance syndrome (UARS) has been used to identify patients with daytime somnolence resulting from repetitive electroencephalographic (EEG) arousals and increased inspiratory esophageal pressures during sleep. The absence of frank apneas or desaturations differentiate UARS from obstructive sleep apnea (OSA), but the treatment for both conditions is similar using continuous positive airway pressure (CPAP) ventilation. The exact anatomic cause of UARS is presumably unlike that of OSA but typically is not delineated in discussions of the topic. Herein we present a patient with retrolingual enlargement masquerading as noctur-
nal asthma and successfully treated with an airway dilator instead of the standard treatment modality of continuous positive-pressure ventilation.

**CASE PRESENTATION**

The patient is a 33-year-old woman with severe persistent asthma who chronically required high-dose inhaled steroids and oral prednisone since her initial diagnosis in 1991. Her asthma was bronchodilator proven with a baseline forced vital capacity of 1.56 L (42% predicted) and a forced expiratory volume in 1 second (FEV₁) of 1.65 L. A 131% improvement in her FEV₁ was demonstrated following beta-agonist use. Her care was further complicated by skin test–proven atopy, gastroesophageal reflux on esophageal manometry, and a 20-pound weight gain over the course of 2 years.

Despite an intense medical regimen of inhaled steroids, oral prednisone, and methotrexate, the patient continued to have poorly controlled symptoms and concerns. Possible vocal cord dyskinesia masquerading as asthma prompted a laryngoscopy. Vocal cord dyskinesia was not seen during laryngoscopy, but retrolingual enlargement was apparent during examination (Fig. 1). Detailed questioning after the procedure divulged excessive daytime somnolence, loud snoring, and frequent nocturnal awakenings, which the patient attributed to her nocturnal asthma symptoms.

Polysomnography was performed because of concern about occult obstructive sleep apnea, and it revealed heavy snoring with frequent respiratory related arousals but an apnea-hypopnea index of less than 5, precluding the diagnosis of OSA. In view of the snoring and frequent arousals, a repeat polysomnography with an esophageal manometer was done and resulted in a diagnosis of UARS documented by a respiratory-related arousal index of 23 per hour and nadir in esophageal pressure of −25 cm H₂O. Intolerance of the CPAP device and concerns for postoperative airway compromise because of asthma precluded somnoplasty as an option for treatment. A Halstrom silencer temporary airway dilator (Halstrom Hinge; Surrey, BC, Canada) was prescribed in an effort to advance the mandible and the base of her tongue.

A repeat polysomnogram showed normalization of the esophageal pressure measurements, resolution of the EEG arousals, and snoring. Direct laryngoscopy with the mandibular device in place also showed obvious improvement in airway patency during wakefulness. The patient reports complete relief of nocturnal symptoms and is currently doing well on a tapering dose of prednisone.

**DISCUSSION**

The exact anatomic abnormality leading to the diagnosis of the UARS remains undefined. Diagnosis of UARS is made using esophageal manometry...