

CONTENTS

Preface

John D. Harwick

xi

Physiology of Sleep Disordered Breathing

B. Tucker Woodson and Rose Franco

691

Obstructive sleep apnea (OSA) results from complex interactions between anatomy and physiology. A structurally small and abnormally collapsible upper airway predisposes to disease, and interacts with normal and pathologic physiologic mechanisms to determine severity of disease. Understanding the pathophysiology provides insight into airway collapse, and may improve treatment and lead to potential new medical and surgical treatments for OSA.

Interpretation of the Adult Polysomnogram

Rahul K. Kakkar and Gilbert K. Hill

713

Polysomnography provides information on the physiological changes occurring in many different organ systems in relation to sleep stages and wakefulness. It allows qualitative and quantitative documentation of abnormalities of sleep and wakefulness, of sleep-wake transition, and of physiological function of other organ systems that are influenced by sleep. Polysomnography is considered to be the “gold standard” for diagnosing sleep disordered breathing (SDB) and other sleep disorders; however, as with most other diagnostic tests, polysomnography is not ideal, but is rather the best available method to diagnose SDB. Review of clinical history, pre- and post study questionnaires, medications, and technician’s comments at the time of interpreting the PSG provides a unique opportunity to correlate clinical and electrophysiological data, and is a good investment of time toward improving patient outcomes and avoidance of unnecessary testing.

Interpretation of the Polysomnogram in Children

745

Mary H. Wagner and Daniel M. Torrez

Polysomnography (PSG) is a useful tool for the diagnosis of sleep disorders in children. This multichannel study obtains information about sleep architecture, respiratory effort, movements during sleep, respiratory events, and gas exchange to facilitate the evaluation of children who have disrupted sleep or suspected SDB. Children should be studied in a sleep laboratory equipped for and staffed with personnel comfortable with and experienced in the performance of PSG in children. The scoring and interpretation of PSG differs in children and adults. The pediatric PSG should be interpreted by a pediatric professional knowledgeable in normal development and sleep disorders in children.

Home Sleep Testing in the Diagnosis and Treatment of Sleep Disordered Breathing

761

Minal R. Patel and Terence M. Davidson

Sleep-disordered breathing is a growing public health concern and an integral part of head and neck surgery. Multichannel home sleep testing is a cost-effective, patient-friendly, scientifically valid technique of evaluating patients who present with symptoms of sleep-disordered breathing, typically snoring or daytime sleepiness. Home sleep tests can be dispensed from the physician's office. They have a 95% successful recording rate. Scoring can be auto-score or manual score. There are several protocols that can be followed based on diagnostic outcomes.

Diagnostic Studies in Obstructive Sleep Apnea

785

Kunal Thakkar and Mike Yao

The standard for the diagnosis of obstructive sleep apnea (OSA) is polysomnography (PSG). Although PSG helps identify individuals who have OSA and guides medical management, it does not identify the obstruction site or predict surgical results. Radiologic and diagnostic studies have been used to direct surgical intervention and predict outcomes of sleep apnea surgery. These studies include lateral cephalometric radiographs, CT, MRI, asleep fluoroscopy, asleep and awake endoscopy, upper airway manometry, and acoustic reflection techniques. The ideal diagnostic study would identify individuals who have OSA, be cost-effective and readily accessible, and guide therapeutic, site-specific intervention with predictable results. In this article, the various modalities are reviewed in terms of their capability to effectively diagnose and guide treatment of OSA.

Continuous Positive Airway Pressure for the Treatment of Sleep Apnea

807

Susmita Chowdhuri

Continuous positive airway pressure (CPAP) has become the treatment of choice for obstructive sleep apnea syndrome. Successful therapy with CPAP depends greatly on individual patient acceptance and compliance. Current indications for CPAP, including those for mild obstructive sleep apnea, will need to be revisited when results from the longitudinal follow-up of the Wisconsin Cohort and the Sleep Heart Health Study are made available.

Surgery of the Palate and Oropharynx

829

Michael Friedman and Paul Schalch

Progress in successful surgical treatment of the obstructive sleep apnea/hypopnea syndrome (OSAHS) has been based on adjunctive treatment of the hypopharynx. Still the palate and oropharynx are the major areas of intervention, and certainly the most commonly operated upon. To ensure a successful outcome, appropriate surgical candidates must be identified. The authors present a method of clinical staging based on the position of the tongue relative to the soft palate as well as the size of the tonsils, aimed at identifying the most likely level of obstruction in patients who have OSAHS. We also present several surgical techniques that address obstruction at the level of the soft palate and oropharynx.

Hypopharyngeal Airway Surgery

845

Kasey K. Li

Obstructive sleep apnea (OSA) is the result of upper airway obstruction during sleep. Hypopharyngeal airway obstruction can be caused by the prominence or relaxation of the base of the tongue, lateral pharyngeal wall, and occasionally, the aryepiglottic folds or epiglottis. Although nasal continuous positive airway pressure (CPAP) is considered as the first treatment for obstructive sleep apnea, surgery has been shown to be a viable option for patients who are intolerant of positive pressure therapy. This article presents the current state of hypopharyngeal surgery for sleep apnea. Preoperative airway evaluation with fiberoptic nasopharyngoscopy, the use of lateral cephalometric radiograph, and the formulation of a surgical plan with selection of procedures to address hypopharyngeal obstruction are discussed.

Surgery for Pediatric Sleep Apnea

855

David H. Darrow

Sleep-related breathing disorders (SRBD) in children are caused by a diverse group of anatomic and physiologic pathologies. These

disorders share a common clinical presentation as stertor or sonorous breathing, occasionally accompanied by apneic events of variable duration. Successful management depends on accurate identification of the site of obstruction and the severity of obstruction. Intervention, both surgical and nonsurgical, is tailored to the disorder. In children with SRBD, such intervention may alter behavior and cognition, improve sleep and feeding, or even save a life.

Preoperative and Postoperative Management of Obstructive Sleep Apnea Patients

877

Samuel A. Mickelson

Safe perioperative management of patients with obstructive sleep apnea (OSA) requires special attention to preoperative and postoperative care. Patients with OSA are more likely to have comorbidities including hypertension, esophageal and laryngopharyngeal reflux disease, coronary artery disease, and obesity. Obesity may also contribute to deep vein thrombosis and pulmonary emboli. OSA increases the risk for anesthetic and postoperative complications. The recommendations for measures for preoperative and postoperative management of OSA presented in this article are based on a culmination of 20 years experience supported by the peer-reviewed medical literature.

Success and Failure in Treatment of Sleep Apnea Patients

891

Richard L. Goode

A variety of surgical procedures exist to treat obstructive sleep apnea in adults. Some, such as tracheotomy and maxillomandibular advancement, have very high cure rates, over 90%. These procedures have significant disadvantages, however, and there is a need to define the best combination of low morbidity procedures to provide similar success. To do this, better means to diagnose the sites of obstruction must be used and new procedures must be developed. This article reviews where we are in reaching these goals.

Index

903