

Comments on Selected Recent Dysphagia Literature

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Pediatric Fiberoptic Endoscopic Evaluation of Swallowing

Hartnick CJ, Hartley BEJ, Miller C, Willging JP
Ann Otol Rhinol Laryngol 109:996–999, 2000

The use of fiberoptic endoscopic evaluation of swallowing (FEES) was prospectively studied in 568 pediatric patients (median age = 2.5 years; range = 3 days to 21 years). The unique aspects of pediatric vs. adult FEES were discussed, e.g., transnasal insertion of a flexible endoscope in a child and anatomical differences regarding size and position of the larynx with maturation. FEES was shown to provide clinically relevant diagnostic information on laryngeal disorders that may affect the child while at the same time evaluating the swallowing mechanism.

Comments

As more clinicians have become familiar with FEES to both diagnose and treat swallowing disorders, its use has spread to various specialty populations, e.g., developmental delay/mental retardation, traumatic brain injury, and tracheotomy/ventilator dependent. Use of FEES in the pediatric population to complement the current armamentarium of diagnostic procedures is a natural extension of its use and versatility.

Aspiration Pneumonitis and Aspiration Pneumonia

Marik PE
N Eng J Med 344:665–671, 2001

This article discusses the physical and bacteriologic diagnostic features differentiating aspiration pneumonitis and aspiration pneumonia. Although some overlap exists, they are distinct clinical syndromes and need to be managed differently. Aspiration pneumonitis is defined as acute lung injury after

inhalation of regurgitated gastric contents and results in a chemical burn of the tracheobronchial tree and pulmonary parenchyma, causing an intense parenchymal inflammatory reaction. Aspiration pneumonia develops after inhalation of colonized oropharyngeal material and refers specifically to development of a radiographically evident infiltrate in patients who are at increased risk for oropharyngeal aspiration. Antibiotic therapy is unequivocally indicated in patients with aspiration pneumonia but not indicated initially in the majority of patients with aspiration pneumonitis. In addition, corticosteroids have been shown to be of no benefit in the treatment of aspiration pneumonitis. The author points out that the major pulmonary-aspiration syndromes are frequently misdiagnosed and poorly treated because of failure to distinguish aspiration pneumonitis from aspiration pneumonia, tendency to consider all pulmonary complications of aspiration to be infectious, failure to recognize the spectrum of pathogens in patients with infectious complications, and the misconception that aspiration must be witnessed for it to be diagnosed.

Comments

All clinicians involved in the treatment of patients with both acute and chronic medical conditions, e.g., traumatic brain injury, intubation, stroke, progressive neurological disorders, and dementia, should be aware of the different aspiration syndromes and their treatments. Too often all pneumonias are categorized as aspiration pneumonias and treated as such. This article should heighten awareness of this important issue.

Developmental Patterns of Rhythmic Suck and Swallow in Preterm Infants

Gewolb IH, Vice FL, Schweitzer–Kenney EL, Taciak VL, Bosma JF
Dev Med Child Neurol 43:22–27, 2001

This project was designed to describe the early development of nutritive suckle feeding in a group of preterm infants [$N=20$; gestational age=26–33 weeks; postmenstrual age (PMA)=32.1–39.6 weeks; postnatal age (PNA)=2.0–11.6 weeks] at low risk for both neurological and respiratory impairment, with special consideration of the ontogeny of the underlying rhythmic patterns involved. It was hypothesized that the maturation of the rhythms of the oral feeding components would follow a predictable postnatal developmental sequence which would be developmentally regulated and would relate to PMA rather than PNA. Results indicated that the percentage of sucks aggregated into runs, length of sucking runs, and stability of sucking rhythm all directly correlated with increasing PMA. None of these measures correlated with PNA. In addition, stable swallow rhythm appears to be established earlier than suck rhythm. The fact that PMA is a better predictor than PNA of these patterns lends support to the concept that these patterns are innate rather than learned behaviors. Quantitative assessment of the stability of suck and swallow rhythms in preterm infants may allow prediction of subsequent feeding dysfunction as well as more general underlying neurological impairment. Knowledge of the normal ontogeny of the suck and swallow rhythms may also enable differentiation between immature (but normal) feeding patterns in preterm infants from dysmature (abnormal) patterns, allowing more appropriate intervention measures.

Comments

This well-designed study adds valuable information on the development of the suck–swallow–respiration reflex in preterm infants. As more information concerning normal preterm maturation rhythm patterns of feeding is gathered, clinicians will be able to differentiate better normal vs. abnormal feeding patterns in order to provide more appropriate intervention techniques.

Routine Fiberoptic Endoscopic Evaluation of Swallowing Following Prolonged Intubation

Ajemian MS, Nirmul GB, Anderson MT, Zirlen DM, Kwasnik EM

Arch Surg 136:434–437, 2001

Intensive care unit (ICU) patients who require mechanical ventilation and prolonged endotracheal intubation are at risk for dysphagia and aspiration with

the potential for subsequent pulmonary complications when feeding is started. In this prospective study, 48 ICU patients who were intubated for at least 48 hours received fiberoptic endoscopic evaluation of swallowing (FEES) within 48 hours of extubation. Results indicated overall incidence of swallowing dysfunction at 56%, with 25% of patients exhibiting silent aspiration. Appropriate diet modifications or recommendations for no oral intake were made based on FEES, and it was reported that no patient developed a clinically significant pulmonary complication. Since over 50% of patients intubated for 48 hours or longer had swallowing dysfunction and no clinical features were consistently associated with aspiration, the authors currently use FEES to evaluate all patients requiring prolonged intubation.

Comments

There is ongoing debate on how best to assess swallowing disorders in the ICU and specifically in patients postextubation. Is the critical duration of intubation that impacts on swallowing 48 hours or is it shorter/longer? Do patient demographics play a role, e.g., age, comorbidity, or prior medical history? Can subjective clinical features be found that reliably screen for dysphagia risk in this population, e.g., narcotic and sedative use or altered mental status? This article provides evidence that FEES—a relatively noninvasive, objective, repeatable, bedside assessment—allows for both the diagnosis and treatment of pharyngeal dysphagia in the ICU. Because of the small sample size and nonrandomized design, however, it is difficult to answer the above questions or determine if testing impacts in a causal manner on incidence of pulmonary complications. We look forward to more information in this important area.

Treatment of Cricopharyngeal Dysfunction by Endoscopic Laser Myotomy

Brondbo K

Acta Otolaryngol Suppl 543:222–224, 2001

Since 1995, the author has treated seven patients with cricopharyngeus dysfunction by endoscopic myotomy using the CO₂ laser. There were no immediate or late complications. All patients, except one, stated by questionnaire that swallowing had improved since the surgery, and more than half of the patients gained weight.

Comments

The main contribution of this publication is to the description of a technique of myotomy that has been adapted from an established method used to treat Zenker's diverticulum by endoscopic CO₂ laser surgery. Because the results of the surgery are primarily questionnaire-based, they are subject to biases that may be unrelated to the surgical effect. The data could have been strengthened significantly if pre- and postoperative parameters had been selected prospectively to document physical and functional effects of myotomy. Otherwise, one wonders whether a sham operation would also have produced similar improvements in perception of swallowing ability.

Complications after Laryngeal Surgery: Videofluoroscopic Evaluation of 120 Patients

Kreuzer SH, Schima W, Schober E, et al.
Clin Radiol 55:775–781, 2000

The authors retrospectively study the videofluoroscopic examinations of 120 patients with suspected complications after laryngeal resection [partial laryngectomy ($N=65$) and total laryngectomy ($N=55$)]. Swallowing functions, such as oral bolus control, laryngeal elevation and closure, presence of pharyngeal residue, and aspiration, as well as structural changes, such as strictures, fistulae, and/or tumor recurrences, were assessed. Postoperative abnormalities were identified in 110 patients, including 9 pharyngeal strictures, 6 fistulae, and 13 mass lesions. Aspiration was identified in 63 patients, predominantly in those undergoing partial laryngectomy (61/65). Aspiration likely occurred before the swallow in 5 patients, during the swallow in 34 patients, and after the swallow in 9 patients. Fifteen patients demonstrated aspiration in more than one phase of swallowing. It was concluded that aspiration is very common following partial laryngeal resection.

Comments

The authors are commended for reminding us that partial laryngectomy produces a functional compromise between swallow and vocal production. Several weaknesses of the article, however, remain issues for discussion. The authors emphasize that their retrospective review assesses complications following state-of-the-art laryngeal cancer surgery. And yet, newer forms of near-total laryngectomy, radical endoscopic laser resection of supraglottic and cordal cancers, and supracricoid partial laryngectomy with

cricohyoidopexy are not among those surgeries included. Furthermore, the authors emphatically state that endoscopy “does not show anatomy and function during swallowing.” We now recognize that fiberoptic endoscopic evaluation of swallowing plays an ever important role in the diagnosis and treatment of pharyngeal dysphagia and complements the videofluoroscopic examination.

Although the authors conclude that aspiration is a very common complication of surgery, they fail to assess the presence of aspiration *before* surgery. We should be reminded that tumors also alter function, and while patients may aspirate following partial laryngectomy, it is equally possible that they aspirated before surgery and the magnitude of aspiration may in fact be less after and as a result of surgery. The article fails to address this possibility. Also, because the postoperative time interval of videofluoroscopic testing was not stipulated, it is impossible to judge the effect of rehabilitation on swallow function in the cohort of study patients. Again, the immediate effects of surgical inflammation or later scarring have profound effects upon the success of rehabilitation. The article does not describe the frequency, type, or intensity of rehabilitative therapy. In summary, despite extensive analyses, the authors unfortunately fail to differentiate the disease from its treatment.

Motions of the Posterior Pharyngeal Wall in Human Swallowing: A Quantitative Videofluorographic Study

Palmer JP, Tanaka E, Ensrud E
Arch Phys Med Rehabil 81:1520–1526, 2000

This study attempted to quantify segmental motions of the posterior pharyngeal wall during swallowing. Six adult healthy volunteers participated. Radiopaque suction markers were inserted transnasally and attached to the midline of the posterior pharyngeal wall of the upper and lower oropharynx, pharyngo-esophageal segment, and cervical esophagus. Three questions were asked. First, is the amount of posterior pharyngeal wall elevation greater for the hypopharynx than for the oropharynx? Second, does the posterior pharyngeal wall elevate more than the larynx during swallowing? Third, how are the displacements of the posterior pharyngeal wall affected by changing bolus volume? Results indicated that posterior pharyngeal wall elevation was greater for the hypopharynx than for the oropharynx, confirming that the pharynx shortens significantly during swallowing. The posterior pharyngeal wall elevated more than the larynx during swallowing, indicating that the mechanism of pharyngeal elevation is not simply

traction applied by the elevating larynx. Lastly, there were no volume-dependent changes in displacement of the markers on the posterior pharyngeal wall.

Comments

This is an elegant study that addresses important biomechanical features of the pharynx during swal-

lowing. The fact that there appear to be two distinct movement patterns, i.e., pharyngeal shortening and laryngeal elevation, that have distinct and separate innervations may allow for specific therapeutic interventions based on site of lesion and neuromuscular involvement. We look forward to future reports dealing with both normal pharyngeal biomechanics as well as with pathologic conditions.