



Swallowing problems and Dysphonia after Intubation

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Abstract: Endotracheal intubation is more common in ICU patients. Critically ill intensive care unit (ICU) patients present a variety of factors that increase the risk of aspiration, such as a decreased level of consciousness, excessive sedation and analgesia, a supine resting position, and the insertion of endotracheal tubes. The orotracheal tube can cause laryngeal complications that may result dysphagia and dysphonia. It is suggested that patients submitted to prolonged intubation that have the identified risk factors for dysphagia, dysphonia and aspiration should be submitted to early Speech Therapist assessment.

Introduction

The patient in the ICU often requires mechanical assistance to maintain airway patency. Inserting a tube into the trachea, bypassing upper airway and laryngeal structures, creates an artificial airway. The tube is placed into the trachea via the mouth or nose past the larynx (**endotracheal [ET] intubation**) or through a stoma in the neck (*tracheostomy*). ET intubation is more common in ICU patients. It can be performed quickly and safely at the bedside. Indications for ET intubation include (1) upper airway obstruction (e.g., secondary to burns, tumor, bleeding), (2) apnea, (3) high risk of aspiration, (4) ineffective clearance of secretions, and (5) respiratory distress

Endotracheal Intubation

In *oral intubation* the ET tube is passed through the mouth and vocal cords and into the trachea with the aid of a laryngoscope or bronchoscope. In *nasal ET intubation*, the ET is placed blindly (i.e., without visualizing the larynx) through the nose, nasopharynx, and vocal cords. Oral ET intubation is the procedure of choice for most emergencies because the airway can be secured rapidly. Compared with the nasal route, a larger-diameter tube can be used for oral intubation. With a larger-bore ET tube, work of breathing (WOB) is reduced because there is less airway resistance. It is easier to remove secretions and perform fiberoptic bronchoscopy if needed. Nasal

ET intubation is indicated when head and neck manipulation is risky. Critically ill intensive care unit (ICU) patients present a variety of factors that increase the risk of aspiration, such as a decreased level of consciousness, excessive sedation and analgesia, a supine resting position, and the insertion of endotracheal tubes. In the presence of one or more of these factors, oropharyngeal dysphagia is a common complication that can occur due to neurological, psychogenic, or mechanical impairment, with characteristics that vary from

silent to symptomatic. In symptomatic oropharyngeal dysphagia, patients may complain of coughing, choking, or a wet-sounding voice; these signs and symptoms are also frequently perceived by assisting staff or caregivers. Silent aspiration may occur due to a lack of sensation and, thus, an absence of complaints or protective reflexes, hampering the early detection of this disorder.

Since it is an invasive procedure, orotracheal intubation damages the mucosa of the oral cavity, pharynx, larynx, and trachea. It is known that endotracheal tubes, due to their abrasion effect on the mucosa, cause dysphagia and supraglottic edema and decrease laryngeal sensitivity. The swallowing reflex is also compromised when there is damage to the peripheral and bulbar innervation. Aspiration resulting from dysphagia occurs in 14–56% of patients who received mechanical ventilation for 48 hours or more. Traumatic emergency intubations can cause abrasions and/or lacerations during placement of the tube. The tube caliber and high cuff pressures can also result in higher impact injuries such as paralyses and paralyses, which can alter the motor patterns and sensitivity of affected structures. These injuries can happen during the orotracheal intubation period or permanently persist after intubation. Patients with dysphagia may present complications such as impaired nutritional status, dehydration, and pulmonary infections⁶. The rate of aspiration pneumonia in these patients is high and the chance of death is 3 times higher than that in patients without dysphagia.

Dysphagia and dysphonia after intubation

Dysphagia is defined as the difficulty or inability to safely and efficiently transfer food and fluids from the oral cavity to the stomach, and is usually observed in critically-ill patients who required orotracheal intubation for mechanical ventilation. As a result of the swallowing disorder, the patient may have risks of dehydration, malnutrition, aspiration of secretions or food, and death.

The orotracheal tube can cause laryngeal complications related to duration of intubation, orotracheal tube size and cuff pressure, that may cause irreversible sequelae to the patient. Among the possible complications resulting from prolonged orotracheal intubation, oropharyngeal dysphagia is notable.

The incidence of oropharyngeal dysphagia obtained in this study was 35.9% and the risk of aspiration was 24.9%. The literature shows a wide variability regarding dysphagia incidence, which can be attributed to the tools used in the diagnosis, either through instrumental or clinical evaluation, as well as related to the characteristics of the study population. Some studies have demonstrated an occurrence of dysphagia greater than 20%, either through clinical and/or instrumental evaluations² and the incidence of aspiration, obtained through videofluoroscopy, between 20% and 56% of patients being mechanically ventilated for at least 48 h. Considering the risks patients are prone to have when dysphagia is present and the clinical complications inherent to bronchoaspiration, this study found a high prevalence rate of dysphagia and aspiration risk. Therefore, it is of utmost importance that the intensive care team be aware of the risk factors and aim to minimize such prevalence rates.

It is known that the instrumental assessment of swallowing, performed by videofluoroscopy or videoendoscopy, is the most reliable method of swallowing assessment. However, it is not always performed in clinical practice due to patients' clinical instability and the inability of patients to cooperate or the unavailability of these resources at the service. The ideal situation would be performing the evaluation in the ICU, with transportable equipment such as the swallowing videoendoscopy.

Post-extubation dysphagia is considered a multifactorial condition, which may occur due to oropharyngeal muscular inactivity, glottic lesion, mucosal inflammation leading to loss of tissue architecture, vocal fold ulcerations, and prolonged narcotic and anxiolytic drug effects that may attenuate airway protective reflexes

Several studies has revealed that age was a predictive factor for both dysphagia and aspiration risk, increasing the risk by five and six-fold, respectively. In addition, there was a higher prevalence of dysphagia and risk of aspiration in the elderly than in non-elderly adults. However, there is no consensus in the literature

regarding the predisposition to dysphagia or the risk of aspiration due to age. Some studies have shown an increased risk of post-extubation aspiration in patients 55 years of age or older. The elderly patients do not have an increased risk of swallowing disorders after extubation when compared to the young population. However, the age variable seems to significantly affect the resolution of dysphagia, since the return to oral feeding in the elderly tends to be delayed.

Regarding intubation time, it was observed that patients who remained intubated for 8–14 days showed a 5.5-fold higher risk of aspiration. This value is three times greater than that found in a recent study, which reported that the risk of developing post-extubation dysphagia was 1.82-fold higher in subjects intubated for 7 days. Another study suggests that the higher frequency of predictive signs of aspiration risk is present even earlier, after only six days of intubation. Time of intubation was also considered an independent predictor of dysphagia in other studies. The presence of the orotracheal tube causes alterations in the chemoreceptors and/or mechanoreceptors located in the pharyngeal and laryngeal mucosa, involved in the swallowing reflex. Alterations from a mechanical cause are directly related to the duration of intubation and the size of the endotracheal tube, since these may cause mucosal inflammation leading to loss of architecture, oropharyngeal muscular atrophy due to lack of use during intubation, reduction of proprioception and laryngeal sensitivity.

Airway complications secondary to orotracheal intubation are frequent and the symptoms are usually of short-duration, but in some cases, the lesions may be severe and permanent, and involve laryngeal and tracheal structures. Occasionally they requiring a surgical treatment.¹⁷ According to Mota et al., the most frequent alterations are: edema, ulcers, lacerations, cartilaginous trauma, dysphonia, vocal fold paresis or paralysis, polyps, granulomas and laryngeal stenosis. One of the most frequent symptoms observed by patients submitted to orotracheal intubation is hoarseness. Studies reveals that some degree of hoarseness in 61.9% of our patients with, which is above the reported incidence of 14.4–50%.¹⁷ It is believed that the patients' clinical conditions may have influenced this, since most of them had chronic comorbidities, such as diabetes mellitus and systemic arterial hypertension. Additionally, it is known that such diseases make patients more vulnerable to mechanical damage and cuff pressure of the orotracheal tube due to peripheral diabetic neuropathy and arterial atherosclerotic alterations of the larynx.³² Normally, resolution of dysphonia occurs between 24 and 48 h; however, if symptom persist for more than 72 h, vocal fold lesions should be suspected

Alterations in glottic function are also related to dysphagia, as the vocal folds are responsible for both phonation and the protection of the lower airways. Glottic coaptation and impairment of laryngeal sensitivity result in the risk of aspiration. In this study, there was a significant association between altered vocal quality and dysphagia and risk of aspiration.

It is verified that patients submitted to prolonged intubation who manifest glottic dysfunction have a considerably increased chance of having dysphagia and aspiration. Research study revealed that the patients who had an altered vocal quality had a 45-fold higher chance of developing dysphagia. This odds ratio is greater than twice that found in the literature, of which risk of dysphagia was 20-fold higher. Therefore, it is emphasized that the intensive care team should be attentive to the symptom of post-extubation dysphonia, since the vocal alteration makes the patients susceptible to the risk of dysphagia and aspiration. It is important that the patients must be evaluated early, preferably by a Speech Therapist and by an otorhinolaryngologist, in order to minimize the impact triggered by orotracheal intubation. Moreover, it helps in the quick identification of these patients, so they can receive the adequate Speech Therapist intervention at an early stage.

Conclusion

Thus, it is suggested that patients submitted to prolonged intubation that have the identified risk factors for dysphagia, dysphonia and aspiration should be submitted to early Speech Therapist assessment. The recognition of these predictive factors by the entire multidisciplinary team can minimize the possibility of clinical complications inherent to the risk of dysphagia, dysphonia and aspiration in extubated patients.

References

1. M Scott: Endotracheal intubation (assist). In DL Wiegand, KK Carlson (Eds.): *AACN procedure manual for critical care*. ed 5, 2005, Elsevier Mosby, St Louis.
2. M.S. Ajemian, G.B. Nirmul, M.T. Anderson, D.M. Zirlen, E.M. Kwasnik Routine fiberoptic endoscopic evaluation of swallowing following prolonged intubation implications for management *Arch Surg*, 136 (2001), pp. 434-437
3. C.V.R. Brown, K. Hejl, A.D. Mandaville, P.E. Chaney, G. Stevenson, C. Smith Swallowing dysfunction after mechanical ventilation in trauma patients *J Crit Care*, 26 (2011)108.e9–13
4. V.A. Ferraris, S.P. Ferraris, D.M. Moritz, S. Welch Oropharyngeal dysphagia after cardiac operations *Ann Thorac Surg*, 71 (2001), pp. 1792-1795
5. K. Tolep, C.L. Getch, G.J. Criner Swallowing dysfunction in patients receiving prolonged mechanical ventilation *Chest*, 109 (1996), pp. 167-172
6. S.A. Skoretz, H.L. Flowers, R. Martino The incidence of dysphagia following endotracheal intubation: a systematic review *Chest*, 137 (2010), pp. 665-673
7. J. Barker, R. Martino, B. Reichardt, E.J. Hickey, A. Ralph-Edwards Incidence and impact of dysphagia in patients receiving prolonged endotracheal intubation after cardiac surgery

