

CLINICAL VIGNETTE

A Hard Pill to Swallow

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Background

Difficulty swallowing is common with advancing age.^{1,2} A study conducted on independent older adults, reported prevalence of 17% in the 70-79 year-olds and 33 % in the ≥ 80 year-olds.^{3,4} Among nursing home residents, the prevalence is much higher, with more than 50% of the residents affected. Among hospitalized older adults, up to 44% have swallowing difficulty.⁴⁻⁶ Oropharyngeal dysphagia is most common in patients with neurological disorders. It is observed in up to 64% of stroke patients and in over 80% of patients with dementia.^{7,8} The high prevalence of dysphagia in patients with dementia is not surprising, as swallowing dysfunction often characterizes the late stages of neurodegenerative diseases commonly affecting the elderly, such as Alzheimer's disease and Parkinson's disease. Oropharyngeal dysphagia is associated with increased mortality.⁸ Serious consequences arise from tracheobronchial aspiration resulting in recurrent respiratory infections and acute aspiration events, as well as from decreased efficacy of swallowing function leading to malnutrition and dehydration.^{4,9} Despite its prevalence and its significant impact on quality of life and mortality, dysphagia is often underreported, undetected or unaddressed. Affected older adults may simply accept the condition as part of normal aging and not bring it to medical attention, or they may be unaware of their swallowing dysfunction. Clinicians may not recognize more subtle presentations, or may underappreciate the life-limiting consequence in frail patients with advanced neurodegenerative diseases. Management in late life should include: determining the efficacy of the swallowing mechanism to deliver adequate nutrition and hydration, the safety of various food textures and liquid consistencies and the individual patient's wishes and care preferences.

Case

An 82-year-old man with advanced dementia presented with fever and lethargy for one day. His past medical history includes: Parkinson's disease, HTN, hyperlipidemia, chronic kidney disease, gout, osteoarthritis, gastroesophageal reflux, constipation, and remote history of heart transplant. He had recent hospitalizations for aspiration pneumonia, and was diagnosed with recurrent aspiration pneumonia and was treated with intravenous antibiotics and intravenous hydration. As he improved over the next couple of days, he was started on an oral diet. His nurse noticed difficulty swallowing his medications. A modified barium swallow study (MBSS) noted the following findings: prolonged holding of liquid and pureed food in the

oral cavity requiring verbal cues to swallow; reduced bolus formation and premature spillage of thin liquids and cookie into his pharynx and larynx, reaching the larynx and vallecular before a pharyngeal response occurred. There was a reduced tongue base contraction with variable deflection of the epiglottis. Aspiration of pureed and nectar thick liquids was noted during swallow and no cough was noted during aspiration. The patient was deemed not a candidate for swallowing treatment. Goals of care discussion was held with the patient's daughter, his surrogate decision-maker. Artificial means of nutrition and heroic measures were not consistent with his previously stated care preferences. After discussion with the surrogate, do not resuscitate and do not intubate orders were placed. The medical team also recommended hospice care, and his daughter agreed to an informational hospice consult. The patient was started on a pureed diet and nectar thickened liquids for oral gratification. The patient's caregiver was educated by the speech-swallow therapist to minimize the risk of aspiration. His 14 medications were reviewed and fish oil and 8 other non-essential medications were discontinued. Cyclosporine was switched to a liquid formulation. The patient was discharged home on the 5th hospital day. He enrolled in hospice one week later and passed away peacefully in his home 2 months later.

Discussion

Normal Swallowing and Aging

The swallowing process is best described in three phases. The initial or oral phase is under voluntary muscle control and requires an alert person with preserved ability to masticate. Food is mixed with saliva to form a bolus that is propelled towards the oropharynx by the pressure created by the tongue against the hard palate. The second or pharyngeal phase involves a series of involuntary reflex movements that occur rapidly in a precise and highly coordinated manner to facilitate the safe passage of the food bolus or liquid to the esophagus without getting misdirected to the airway or adjacent cavities. These include the action of the soft palate to seal off the nasal cavity superiorly, the retraction of the base of the tongue to the posterior pharyngeal wall, the closure of the larynx by the epiglottis and the laryngeal muscles of the vocal folds, and the opening of the upper esophageal sphincter (UES) by the relaxation of the cricopharyngeus muscle and contraction of suprahyoid/submental muscles.¹⁰ The third and final phase, the esophageal phase, is involuntary and involves peristaltic

muscular contractions that propel the food bolus through the length of the esophagus. Dysphagia can occur in any of these three phases of swallowing or in combination. The remarkably complex swallowing process involves the cerebral cortex, subcortical neural networks, medullary structures, as well as multiple cranial nerves and muscle groups in the head and neck region and esophagus.¹⁰ Dysfunction in any or a combination of these neural and musculoskeletal components results in dysphagia.

Aging affects the process of deglutition in multiple ways. Xerostomia caused by multiple medications prescribed to older adults may be exacerbated by decreases in salivary flow rates that occur with aging, inhibiting the formation of a smooth food bolus.¹⁰ Loss of dentition or poorly fitting dentures may fail to allow food bolus sizes that are easier to swallow. Sarcopenia affecting the skeletal muscles used for mastication results in weak and inefficient chewing. Age-related decrease in tongue muscle strength leads to reduced pressure generation and poor bolus propulsion during the oral phase.¹¹ Loss of mass and strength of the various muscle groups responsible for moving the food bolus forward to the esophagus results in the overall reduction of the swallowing efficiency. The upper esophageal sphincter (UES) appears to be most affected by the aging process.¹⁰ Weakness in the suprahyoid muscle groups reduces the UES opening and slows the pharyngo-esophageal transit of food, increasing the development of pharyngeal residues and the risk of post-deglutition spillage into the airway.¹⁰ The combination of age-related physiologic changes which result in slowed oral phase, reduced tongue pressure, sluggish swallow reflex, delayed laryngeal closure, reduced transphincteric flow, and diminished swallow volume and efficiency are collectively referred to as presbyphagia.¹⁰ Interestingly, in recent years, the term sarcopenic dysphagia has emerged in literature as a distinct entity associated with the more widespread sarcopenia occurring in skeletal muscles among elderly patients.¹²

Disease-related oropharyngeal dysphagia in older adults may be caused by dementia, Parkinson's disease, stroke, and head and neck cancers. This can also arise from nerve injury following traumatic endotracheal intubation and tumor resections. Esophageal dysphagia may result from esophageal strictures, achalasia, Zenker's diverticulum, food impaction, and mechanical obstruction from malignancies. Clinically significant oropharyngeal dysphagia in the elderly is often primarily the result of disease processes, and is worsened by the age-related decline in the swallowing function.

Diagnosis and Management

The evaluation and management of oropharyngeal dysphagia in the elderly benefit from an interdisciplinary approach, and involve the domains of nurses, speech-swallow therapists, radiologists, dietitians, geriatricians, rehabilitation specialists, ENT specialists, hospitalists, primary care clinicians, and palliative care specialists, and caregivers.

A report of coughing during mealtimes by the patient, family, caregiver, or nursing staff typically prompts an evaluation for dysphagia. In cases of silent aspiration, the decision to pursue diagnostic intervention may require a high index of suspicion (e.g., recurrent pneumonias). A bedside swallow evaluation is a helpful initial screening tool in most cases. Various bedside swallow methods are available in clinical practice. A simple bedside screening can be performed by a trained clinician by giving the patient small amounts of water consecutively, and observing for coughing or clearing of throat, wet or gurgly vocal quality, or the absence of laryngeal elevation. If any of these elements is observed, a formal clinical assessment by a speech-swallow therapist is obtained. The more comprehensive clinical assessment by the therapist may lead to a recommendation for further instrumental evaluation, or may yield a finding that requires other specific interventions (e.g., denture adjustment). Instrumental swallow evaluations are helpful in determining the location and severity of the dysphagia. They also guide recommendations for therapy including exercises, adaptive strategies and compensatory techniques suitable for the identified dysfunction, as well as advise on the safety of oral intake in patients diagnosed with dysphagia. Instrumental evaluations can be accomplished videofluoroscopically through the Modified Barium Swallow Study (MBSS) or endoscopically through the Fiberoptic Endoscopic Evaluation of Swallowing (FEES). MBSS is considered the gold standard for diagnosis and is more widely available; however, it requires the elderly patient to have the ability to sit upright for about 20 minutes. The FEES, if available, can be performed at the bedside and can be done in patients who are unable to tolerate the sitting position. However, patients must have the ability to cooperate in the evaluation.

Before proceeding further with any instrumental examination, it is important to elicit a general sense of the patient's values. For example, if dietary texture modification or if non-oral nutrition is consistent line with patient's wishes and treatment goals. The findings of the study will generally help determine whether the severity of the inefficient swallowing requires the consideration of non-oral means of nutrition delivery, on whether the patient-preferred food texture can continue to be administered orally without harm, and whether the patient will benefit from swallow treatments. Speech and swallow therapists have a key role in helping patients who benefit from therapeutic interventions. For elderly patients who may benefit from adaptive strategies such as dietary texture modification and fluid thickening, efficacy should ideally be confirmed by instrumental examination. These adaptive strategies act by slowing down the swallowing process in patients with delayed swallow response. Other therapeutic interventions involve the use of compensatory measures and rehabilitative exercises; however, these strategies must consider the patient's cognition, medical conditions, resources, and caregiver support. Postural compensations such as chin tuck may help patients with delayed swallow response by displacing the tongue base and epiglottis posteriorly. However, this maneuver may be limited by degenerative disease of the cervical spine.¹⁰ In patients with unilateral pharyngeal weakness, rotation of the head to the

affected side helps protect the damaged side from the food bolus path. Strengthening exercises such as the Shaker exercise are aimed at strengthening the neck and laryngeal muscles to optimize the opening of the EUS. The intensity of this exercise and patient comorbidities, especially cervical spine problems, may limit the applicability in the elderly.¹⁰ In general, aspiration precautions should be observed when caring for the elderly, and they include advising the patient to stay in upright position when eating and drinking, to eat and drink slowly, to take small amounts of food and liquid at a time, and to sit up for at least 30 minutes or longer after meals.

If the instrumental evaluation yields an abnormal result, a follow-up goals of care conversation is often necessary to ensure that proposed treatments and recommendations are aligned with the patient's known values. When the dysphagia is severe and irreversible in an elderly patient, effective goals of care discussions with patients and surrogates must most importantly convey empathy. This condition significantly affects not only life expectancy but also quality of life, especially in patients in whom the enjoyment of food and pleasure of eating are very important. Goals of care conversations should address the patient's overall prognosis and explore the patient's or surrogate's understanding of it. These conversations must elucidate what matters most to the patient and clarify the patient's or surrogate's willingness to accept texture modification and the risks associated with oral intake. The discussions should include alternative approaches to care that prioritize quality of life and comfort for patients with reduced life expectancy. In the setting of advanced dementia, clinical teams should provide guidance to patients or surrogates regarding the very limited role of tube feeding in this context. Due to the harms associated with and the lack of clinical benefits noted with feeding tube use in patients with severe dementia, the American Geriatrics Society recommends against its use, and instead recommends oral assisted feeding for patients with advanced dementia.^{13,14} Oral feeding is comparable with tube feedings in terms of mortality, aspiration pneumonia and functional status outcomes; specific harms associated with tube feeding use in these patients include agitation, increased use of physical and chemical restraints, and worsening of pressure ulcers.^{13,14} These outcomes matter to patients and surrogates. Thus, this information must be included in the discussion when feeding tube is being considered for patients with advanced dementia.

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