DYSPHAGIA IN THE ELDERLY: DIAGNOSIS AND MANAGEMENT

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March 10, 2018

Background

- Estimated that by the year 2050, people aged 65 years or older will account for 25% of the population in developed countries
- Increase in longevity over the past 50 years is being reported
- Need to understand changes in physiology with aging and the unique challenges this population faces


Background: Dysphagia

- Important health concern for elderly populations, intrinsically related to the physiology of aging.
- In the USA dysphagia affects 300,000–600,000 persons yearly.
- Conservative estimates suggest that 15% of the elderly population is affected by dysphagia.
- This suggests that up to 6 million older adults could be considered at risk for dysphagia.

Impact of Dysphagia

- Contributes to a variety of negative health status changes
- Increased risk of malnutrition
- Pneumonia
- Depression
- Significantly impacts quality of life, with social and psychological consequences
  - Social isolation

Process of deglutition

- Involves both voluntary and involuntary muscles
- Controlled by six cranial nerves
- Approx forty bilaterally innervated muscles, which control the upper digestive tract
Process of Deglutition
- Divided into four distinct phases.
  - Oral preparatory
  - Oral transport
  - Pharyngeal
  - Esophageal phases.

Oral Phase: Preparatory phase
- The structures involved are the:
  - lips
  - dentition and muscles of mastication
  - tongue with both intrinsic and extrinsic muscles
  - palate
  - salivary glands
- Transferred posteriorly from oral cavity to pharynx
- Lasts approx 1 sec.

Pharyngeal Phase
- Involuntary and under reflex control
- Consists of two periods:
  - (i) the early nasopharyngeal and oropharyngeal protective period, whereby the bolus is prevented from regurgitating back into the oral cavity.
  - (ii) later laryngeal protective period, whereby the bolus is thereby diverted into the lateral piriform recesses.
- Larynx elevates and moves anteriorly during the swallow, extrinsic stretch is placed on the cricopharyngeus muscle and its adjacent fibers.
- Bolus is now cleared by the stripping action of the superior, middle and inferior constrictor muscles.
- Resetting of the larynx and the upper esophagus now opens by the relaxation of the cricopharyngeus muscle.
- Lasts approx 1 sec.

Esophageal Phase
- Involves active peristalsis or sequential contraction from top to bottom in two waves, primary peristalsis and secondary peristalsis.
- Under involuntary neural control.
- At the base of the esophagus the lower esophageal sphincter (LES) is a circular muscular valve that opens to allow the passage of food but is otherwise closed to prevent gastroesophageal reflux.
- Lasts approx 8-20 secs.

Two Key Events of Swallowing
- Propelling and clearing the bolus through the pharynx
- Closing off the airway

Normal Swallowing Requires more than Movement: Intact Sensori-Motor System
- Sensory activation begins as soon as bolus enters mouth
- Most acute density of sensory receptors on laryngeal rim
Changes in the Physiology of Swallowing with Aging

- Presbyphagia, is the result of multiple factors:
  - age-related changes in head and neck anatomy
  - Changes in the neural and physiological mechanisms that control swallowing
  - Prevalence of diseases increase with aging
  - Common co-finding of many disease processes or their treatments.

What happens with aging

- Loss of muscle mass and function
- Decreased tissue elasticity
- Cervical spine changes
- Decreased saliva production

Aging and effects on the Tongue

- The tongue is the driving force for the initiation of deglutition in normal individuals
  - anterior tongue is mostly used for forming a food bolus
  - composed of type II fast-twitch muscle fibers
  - posterior tongue is involved in involuntary movements such as propulsion of the food bolus, composed of type I slow-twitch fibers.
  - Robbins et al. in multiple studies, demonstrated increased lingual isometric pressures and decreased swallow pressures with aging.
  - Swallow pressure reserve and maximum lingual pressures decrease in older adults as compared to those below sixty years old

Pharyngeal phase

- Manifest as a delay in initiation of the pharyngeal phase and a delay in laryngeal vestibule closure
- Deterioration of the pharyngoglottal closure reflex

Esophageal phase

- Upper esophageal sphincter (UES) dysfunction can also contribute to post swallow residues.
- Esophageal manometry studies on healthy individuals older than 40 years, show increased esophageal stiffness and reduced primary and secondary peristaltic pressures.
- Differences in hyoid anterior movement are indicative of the functional reserve present in given individuals.
Contributing factors

- Neurological and neuromuscular disorders
- Stroke
- Alzheimer’s disease
- Dementia
- Parkinson’s disease

Contributing Factors

- Xerostomia: common finding in older adults
  - Hinders flow of the food bolus and thereby causes its retention in the upper digestive tract
- Elderly: very susceptible to the drying effects of certain medications
  - Anticholinergics
  - Antihypertensives
  - Anti-Parkinsonian agents
  - Psychotropics
  - Diuretics
- Certain diseases or treatments
  - diabetes mellitus
  - scleroderma
  - radiation

Intrinsic causes:

- Esophageal web
- Malignancy
- Cricopharyngeal achalasia
  - associated with GERD
- central causes like strokes, poliomyelitis, myopathies, oculo-pharyngeal muscular dystrophy, post-laryngectomy, Parkinson's disease and amyotrophic lateral sclerosis.
- Zenker’s diverticula

ASSESSMENT

- History Taking
  - Early detection is key in order to prevent complications.
  - Inquire about:
    - Progression
    - Timing of the dysphagia.
  - Validated questionnaires such as the EAT-10 can aid in screening.

Assessment: History

- One of the initial complaints indicating dysphagia can be a feeling of “food getting stuck in the throat”
- Unintentional weight loss
- Coughing while eating
- Having to wash down food with liquids
- Increased time needed to be able to complete meals
- Increased mucus in the throat.
- Social isolation
- How long it takes to finish a meal
- Eating environment
- Recent pneumonia

Physical Examination

- General physical examination
- Neurologic evaluation
  - Mental status
  - Motor and sensory functioning
  - Cranial nerves
  - Cerebellar examination
- Saliva production
- NPL exam
Physical Examination
- Special attention to neurological, mental, and respiratory systems
- Otolaryngology consultation to obtain an endoscopic examination of the larynx and pharynx
  - Flexible laryngoscopy can reveal important findings such as pooling in the vallecula, vocal fold immobility, laryngeal or hypopharyngeal masses, or incomplete glottis closure.

Fluoroscopy and Endoscopy Provide Unique and Complementary Views
- Assess different movements and events

MBS and FEES Provide Unique Perspectives on the Swallow
- **Only Fluoroscopy**: gives a broad view of:
  - Oral -> pharyngeal -> UES -> esophagus
  - visualizes bolus during height of the swallow
  - views oral preparation
  - completeness of tongue retraction
  - UES opening
  - laryngeal elevation
  - extent of aspiration
  - views submucosal anatomy (osteophytes, diverticulum)

- **Only Endoscopy**: gives a direct view of:
  - hypopharyngeal structures (surface anatomy)
  - mucosal abnormalities (edema, erythema)
  - effect of altered anatomy on bolus flow & airway protection
  - glottic closure
  - location of bolus within the HP
  - visualizes secretions
  - directly assesses sensation

Flexible Endoscopic Evaluation of Swallowing (FEES)
- Main advantages is that it can be performed bedside, which is especially useful in hospitalized patients
- No exposure to radiation
- Limited in the assessment of the oral and esophageal phases and in assessing pharyngeal contraction.

Protocol for FEES
- Swallowing test:
  - 1. Before swallowing: premature leakage
  - tongue motion
  - soft palate elevation
  - VP closure
  - pharyngeal constriction
  - laryngeal elevation
  - 2. Immediate post-swallowing: penetration, aspiration, pharyngeal stasis
- 3. Post-swallow:
  - residue spillage, effective cough reflex
Investigations of dysphagia

- **Barium swallow and Modified Barium Swallow**: The gold-standard
- In conjunction with a speech pathologist
- Determines bolus transport and safest consistency, e.g. honey, nectar, thin, pudding, puree, regular
- Possible compensatory maneuvers that may facilitate swallowing.

Pharyngeal and Esophageal Manometry

- Upper and lower esophageal sphincter function, pharyngeal strength and contraction duration, completeness of UES relaxation, and the coordination of pharyngeal contractions and UES relaxation can be assessed.
Manometry

- Assess motor function of the esophagus.
- Catheter with several electronic pressure probes is passed into the stomach.
- Measures:
  - esophageal contractions
  - UES and LES relaxation in response to swallowing

Endoscopy: best assessment of the esophageal mucosa but does not detect esophageal function.

Esophageal pH monitoring

What tests do I use in my practice and what is the rational?

- Laryngoscopy
  - Evaluates for pharyngeal and hypopharyngeal pathology
  - Provides reassurance
- FEES
  - Quick easy information on safe swallow
  - Repeatable
- Barium swallow
  - Evaluates for UES hyperfunction, dysmotility, esophageal abnormalities
  - Non-invasive
- Refer to GI for Manometry
  - Evaluates for UES hyperfunction, and dysmotility
- pH testing +/- impedance
  - Evaluates for reflux, breakthrough reflux, non-acidic reflux
  - Reserved for patients that also have refractory reflux symptoms
- Esophagoscopy
  - Evaluates for esophageal mucosal pathology
  - Cancer is extraordinarily rare without “high risk” symptoms

TREATMENT

- Dysphagia management is a ‘team event’
- Includes: nurses, dietitians, speech and language pathologists, primary care physicians, neurologists, gastroenterologists, and otolaryngologists.
- The main purpose of dysphagia management is the prevention of aspiration and malnutrition

Dilation

- CRE Balloons
  - Pulmonary
  - Esophageal
- Bougies
Cricopharyngeal Spasm

- Baseline EMG – active muscle
- Swallow → +/- relaxation
- Ask pt to sniff

Zenker’s diverticulectomy

- open versus endoscopic procedures.
- method depends on the surgeon’s preferences as well as the anatomy of the patient, comorbidities, the size of the diverticulum and symptoms.
- Surgical treatment options range from:
  - CP dilatation or myotomy
  - Endoscopic assisted stapling of the diverticulum
  - Open diverticulectomy.

Nonsurgical Management

- Swallowing therapy: aims to improve physiology through exercises.
- Most commonly employed strategies are
  - postural adjustments
  - swallowing maneuvers
  - dietary modifications


Postural adjustments

- Changes in body and/or head posture may be recommended as compensatory techniques to reduce aspiration or residue
- Changes in posture may alter the speed and flow direction of a food or liquid bolus
- Postural adjustments are intended to be utilized short term
Swallow maneuvers

- Different maneuvers are intended to address different aspects of the impaired swallow.
  - Supraglottic and super supraglottic swallow techniques both incorporate a voluntary breath hold and related laryngeal closure to protect the airway during swallowing
  - The Mendelsohn maneuver is intended to extend opening or more appropriately relaxation of the upper esophageal sphincter
  - The effortful or ‘hard’ swallow is intended to increase swallow forces on bolus materials with the result of less residue or airway compromise
  - Shaker exercises

Diet modifications: modification of foods/liquids

- Modifying the consistency of solid food and/or liquid is a mainstay of compensatory intervention for patients with dysphagia
- Helps control the speed, direction, duration, and clearance of the bolus
- The goal of diet modification is to improve the safety and/or ease of oral consumption
- Low acceptability and poor adherence with modified foods/liquids

Limitations of thickened liquids

- A primary concern with the overuse of thickened liquids is the risk of dehydration in elderly patients with dysphagia. Patient compliance with thickened liquids is often reduced
- Modified diets may result in reduced food intake, increasing the risk of malnutrition for some patients with dysphagia
- A recent survey of SLPs suggested that honey thick liquids were strongly disliked by their patients but even nectar thick liquids were poorly accepted by more than one in ten patients

Vital Stim

- VitalStim therapy was approved by the US Food and Drug Administration in 2001 for the treatment of dysphagia
- Uses a small current, passing through external electrodes on the neck, to stimulate inactive swallowing muscles.
- Helps with mild to moderate dysphagia.
- Patients with the most severe dysphagia seldom gain independence from their feeding tubes.

Alternative medical treatments

- Acupuncture

Enteral Feeding

- Approximately 30% of PEG tubes are placed in dementia patients
- 10% of institutionalized elderly patients are PEG tube fed
- It is very important to note that PEG placement
  - does not prevent aspiration pneumonia
  - does not improve survival and function
Provision of alternate nutrition

- Non-oral feeding sources can benefit patients with nutritional deficits
- While non-oral feeding methods provide direct benefit in many clinical situations, they do not benefit all elderly patients with dysphagia or nutritional decline.

References


CONCLUSIONS

- A strong relationship appears to exist between dysphagia and the negative health outcomes of malnutrition and pneumonia in patients following stroke, those with dementia, and also in community dwelling elderly adults.
- The key to effective management is recognition.
- Patients tend to dismiss their symptoms as normal aging.
- No diagnostic technique can replace the benefits of a thorough history, with a detailed understanding of nutritional status and aspiration risk.
- While one of the main goals in management is to ensure safe swallowing, the impact of a non-oral diet on the quality of life of a patient should not be underestimated.
- All treatment options should be exhausted prior to PEG placement.

Thank you.