Tip of the Iceberg: Geriatric Dysphagia

Buz Dağının Tepesi: Geriatrik Disfaji

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ABSTRACT

Presbyphagia; is the physiological, structural and sensory changes that occur in the structures related to swallowing with age. Elderly patients adapt to all these changes by making various alteration in their eating habits to maintain normal swallowing function; however, an intervening stressor, comorbid disease or sarcopenic changes can make an asymptomatic swallowing disorder "symptomatic". This situation may be overlooked by the patient himself or the caregivers and may be accepted as a natural consequence of aging. Dysphagia in elderly can lead to serious complications such as malnutrition, dehydration and aspiration pneumonia. Recognizing the situation and not accept it as a natural consequence of old age plays a key role in this problem.

Keywords: Aspiration pneumonia, dysphagia, geriatric swallowing disorder

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ÖZET

Yaş ile birlikte yutma ile ilgili yapılarda meydana gelen fizyolojik, yapısal ve duyusal değişikliklere presbifaji denmektedir. Yaşlı hastalar, yeme alışkanlıklarında çeşitli değişiklikler yaparak tüm bu değişimlere uyum sağlar, normal yutma fonksiyonunu devam ettirir; ancak araya giren bir stres faktörü, eşlik eden bir komorbid hastalık ya da sarkopenik değişiklikler asemptomatik bir yutma bozukluğunu semptomatik hale getirebilir. Bu durum hastanın kendisi ya da bakım hizmeti veren kişiler tarafından gözden kaçırılabilir ve yaşlılığın doğal bir sonucu olarak kabul edilebilir. Disfaji, ileri yaş hastalarda malnutrisyon, dehidratasyon, aspirasyon pnömonisi gibi ciddi komplikasyonlara yol açabilir. Durumun farkına varmak ve bunu yaşlılığın doğal bir sonucu olarak görmemek bu sorunda kilit rol oynar.

Anahtar Sözcükler: Aspirasyon pnömonisi, disfaji, geriatric yutma bozukluğu

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INTRODUCTION

Geriatric dysphagia

Swallowing disorder (dysphagia) is the difficulty in advancing food from the mouth to the stomach. Certain mental and motor function losses that occur together with ageing lead to swallowing and chewing disorders. Physiological, structural, and sensory changes that occur in structures related to swallowing together with ageing, are referred to as presbyphagia. Elderly patients adapt to all these changes by making various changes to their eating habits and continue normal swallowing function, but the stress factor with sarcopenic changes or comorbid disease can cause an asymptomatic swallowing disorder to become symptomatic. This may be overlooked by the patients themselves or their caregivers and can be accepted as a natural result of ageing.

The prevalence or oropharyngeal dysphagia in older adults living alone has been reported to be 30-40% (1), 60% in hospital inpatients (2), 29-64% in those who have experienced stroke (3) and more than 80% in patients with dementia (4-5).

Swallowing disorders can cause serious complications such as malnutrition, dehydration, aspiration pneumonia, and even death. In recent years, swallowing disorders have been accepted as a part of "geriatric syndrome", which is the term used for clinical conditions which do not fit into any disease category, but are frequently seen, multifactorial, are accompanied by more than one comorbidity, and can be treated with a multidisciplinary approach (6).

Swallowing stages

Swallowing has 3 stages: oral, pharyngeal, and oesophageal stages. The oral phase is voluntary, whereas the pharyngeal and oesophageal phases are involuntary reflexive phases. In the oral preparation phase, food is pushed towards the teeth with lateral movements of the tongue and divided into small parts, it is chewed with rotary movement of the jaw and a bolus is formed by mixing with saliva. The most important neuromuscular activity in this phase is the lateral movement of the tongue. By elevating the tongue, the bolus is squeezed between the tongue and the hard palate, is gathered into the middle then advanced to the pharynx by pushing upwards and backwards along the hard palate. During this, even though by a small amount, the contraction of the labial and buccal muscles contributes and prevent the bolus escaping from the mouth. The oral phase lasts 1–5 seconds and can change with age and the texture of the food. When the bolus drops from the oral cavity into the pharyngeal space, the swallowing reflex is triggered, and the pharyngeal phase starts. The actions following this are in the form of simultaneous movements that are very rapid and overlap with each other. Escape to the nose is prevented by velopharyngeal closure, and the bolus is pushed towards the pharynx by the tongue root like a piston within a close relationship with the posterior pharyngeal wall, then with pharyngeal contraction the material is pushed along the pharynx and with contraction of the suprahyoid muscles the larynx is pulled upwards and forwards, and the epiglottis covers and protects the airway. At this point, the upper oesophageal sphincter (UOS), which is fully closed at rest, is opened and with passage of the bolus to the oesophagus, the oesophageal phase starts. The pharyngeal phase lasts no longer than 1 second, and does not show any change with age, gender, or viscosity.

Together with ageing, a series of changes occurs in the structures related to swallowing. These include loss of muscle mass and function, reduced tissue elasticity, vertebral structural changes, loss of teeth, changes in saliva expression, impaired taste and smell, reduced compensatory capacity of the brain, and the airway remains insufficiently protected. The oral transit time is prolonged, oropharyngeal sensitivity reduces, and the triggering of the pharyngeal reflex is delayed. With this delayed reflex, swallowing occurs without protection of the airway. In addition, the muscle mass and strength of the tongue decreases and therefore, compared to healthy adults, older adults must make more effort when swallowing to be able to provide maximal tongue pressure. During swallowing, larynx elevation is decreased because of reduced tissue elasticity, the airway is insufficiently protected, opening of the UOS is delayed, the amount of the bolus remaining increases and there is a risk of aspiration and penetration. Oesophageal motility disorders are frequently seen in older adults (7). By making changes to their diet and eating habits, patients of advanced age maintain swallowing disorders subclinically, but triggering factors or comorbidities can make this condition symptomatic.

Swallowing disorders in elderly

Swallowing disorders are separated into two as oropharyngeal and oesophageal dysphagia. Neurological or rheumatological diseases, diabetes, chronic lung diseases, multiple drug use, anatomic structural changes, sarcopenia, and gastro-oesophageal reflux are risk factors for dysphagia in older adults. Cerebrovascular diseases and neurological diseases such as Parkinson's and Alzheimer's disease often cause dysphagia. The incidence of dysphagia in cerebrovascular disease varies between 37% and 78% (8). Dysphagia is seen more often in brain stem involvement than in hemispheric involvement. It has also been reported that the pneumonia risk in dysphagic stroke patients is 3-fold greater than in stroke patients without dysphagia (8). Aspiration pneumonia is the leading cause of mortality in patients following a stroke. Dysphagia has been reported to be seen in approximately 90% of patients during the course of Parkinson's disease (9). The prevalence of oropharyngeal dysphagia in dementia patients has been shown to be 32-45% in clinical evaluations and 84-93% in instrumental evaluations (10).

The most seen type of dementia is Alzheimer's disease, and dysphagia is seen from the initial stages of the disease. Following central nervous system diseases in older adults, the comorbid diseases most often associated with dysphagia are diabetes and chronic obstructive pulmonary disease (COPD) (11). Swallowing disorders due to xerostomia and oesophageal motility disorders are observed in diabetes. In xerostomia, the bolus fluidity decreases, and risk of remnants increases. Multiple drug use causes dysphagia by altering the expression and intensity of saliva forming drug-related mucositis or with central sedative effects. The most common antipsychotics, benzodiazepines, anti-Parkinson drugs, anti-epileptic drugs, and antidepressants have been found to be associated with oropharyngeal dysphagia in the advanced age group (11).

In addition, diseases such as scleroderma and Sjögren syndrome, or radiotherapy applied to the head and neck region cause xerostomia. Gastro-oesophageal reflux is another disease associated with dysphagia (12). Especially in postoperative patients or those treated in the Intensive Care Unit, reflux constitutes a severe risk for aspiration pneumonia. It may be seen in combination with oesophagus motility disorders. A chronic process causes structural and inflammatory changes such as stricture, eosinophilic oesophagitis, or Barret oeophagus.

The cricopharyngeal bar is seen as evident cricopharyngeus muscle contour in swallowing examination with barium. It is a radiological diagnosis and is seen in 5-19% of patients on videofluoroscopic imaging (13). The frequency at which it is seen increases with age (14). It is generally asymptomatic. On radiographs with barium, it is seen as a projection with round edges in the posterior pharyngeal wall at the level of the C5-C6 vertebrae. Relaxation defect of the muscle or muscle hypertrophy can be seen secondary to fibrosis. Chronic gastroesophageal reflux lays the ground for bar formation. Complaints are related to bar thickness and the degree of obstruction created. In most patients, this condition is compensated for with diet modification or increasing pharyngeal pressure.

Zenker diverticulum is herniation of the oesophagus mucosa and submucosa between the cricopharyngeal muscle and the inferior pharyngeal constrictor muscle. It is generally seen in males and at an advanced age. In Zenker diverticulum, bar and spasm which will create swallowing difficulty, invasive interventions are planned. Cervical osteophytes, which are longitudinal ligament calcification on the anterior surface of the cervical vertebrae as a part of diffuse idiopathic skeletal hyperosteosis (DISH) can be seen secondary to ossification or trauma, infection, osteoarthritis, or ankylosing spondylitis. DISH is seen at a prevalence of 5-35% and usually over the age of 60 years (15). Although the pathogenesis is not known, it is associated with obesity and diabetes. It is generally asymptomatic, is determined incidentally on lateral radiographs, at a thickness of ≥10mm significantly increases the risk of aspiration (16), and pharyngeal obstruction is seen at a thickness of 12-15 mm (17). Although non-surgical treatments such as muscle relaxants, non-steroid anti-inflammatory drugs (NSAID), diet modification, and pantoprazole are applied first, in patients with severe pain and swallowing and respiratory problems, surgery is planned.

Sarcopenia is a condition characterised by widespread progressive loss of muscle mass, strength, and physical performance. The prevalence of sarcopenia in older adults varies between 1 to 29% (18). After the age of 70 years, the loss of muscle mass occurs at the rate of approximately 15% per decade (19- 20). It can be seen as primary, or secondary to systemic diseases such as malignancy, inflammatory or endocrinological disorders, organ failure, or malnutrition. The swallowing disorder that develops due to the effect on swallowing muscles in primary sarcopenia is known as sarcopenic dysphagia.

An age-related decrease is seen in the thickness of the tongue muscles (21), the geniohyoid (22) and pharyngeal wall muscle and an increase in the diameter of pharyngeal lumen (23). These changes cause swallowing difficulty by decreasing tongue strength and movements and pharyngeal muscle contraction.

Together with swallowing difficulty, decreased oral intake, weight loss because of malnutrition, and sarcopenic changes in malnutrition, create a vicious circle causing even more swallowing difficulty.

There are many drugs with detrimental effects on consciousness or oropharyngeal swallowing which are frequently used by older patients (Table 1). (7).

Table 1. Drugs causing swallowing disorders

Effect mechanism	Drugs
Xerostomia	H1 antihistamines, anticholinergics, ACEI*, diuretics, angiotensin II receptor antagonists, Parkinson's disease drugs, antiepileptics, antispasmodics, muscle relaxants, antipsychotics, tricyclic antidepressants, bronchodilators, opioids, retinoids
Sedation	Psychotropic drugs, anticonvulsants, muscle relaxants, antispasmodics, antivertiginous drugs
Mucositis (glossitis, stomatitis, oesophagitis)	Antibiotics, cytotoxic agents, steroids
Neuromuscular junction blockage	Antibiotics (aminoglycosides, erythromycin), Botulinum toxin, penicillamine, procainamide
Myopathy	Corticosteroids, antiepileptics, lipid lowering agents, L-tryptophan

*ACEI: angiotensin converting enzyme inhibitor

Head and neck or oesophageal tumours or surgery, head-neck radiotherapy, prolonged intubation, or tracheotomy cause dysphagia because of the structural changes created in the swallowing physiology and long-term sequelae such as stricture and fibrosis.

Complications of geriatric dysphagia

Swallowing disorders in elderly patients cause serious complications such as malnutrition, dehydration, aspiration, and pneumonia, increase hospital admissions, prolong length of stay, and increase morbidity and mortality rates. Dehydration is among the primary reasons for the admission of elderly patients to hospital (24) and the prevalence is approximately 60% of older adults in the community (25).

Malnutrition and dehydration cause imbalance of fluid electrolytes, low functional capacity, weakness in the immune system, delayed wound healing, and sarcopenia. The frequency of pneumonia is increased in patients of advanced age, compared to those who are younger. In the 65-69 years age group, the frequency of pneumonia is 18.2% and this rate rises to 52% in the ≥85 years age group (26). In addition to aspiration associated with swallowing disorder in elderly patients, reduced oral hygiene, colonisation of the pharynx by different micro-organisms, weakness in the immune system, reduced respiratory muscle strength, mucociliary transport and cough reflex, and comorbid diseases facilitate the formation of pneumonia. Sometimes fever and leucocytosis may not be seen in the course of pneumonia in elderly patients because of impaired physiological response, drugs and existing diseases. Therefore, atypical clinical courses must be kept in mind. In addition, dysphagia in older adults has a negative effect on quality of life, causing mood disorders such as depression and anxiety, and can lead to social isolation.

Screening and clinical assessment

Despite the serious complications and high mortality rates, dysphagia can be overlooked by both patients and their caregivers due to insufficient awareness. The complexity of conditions in elderly patients requires detailed geriatric evaluation. A detailed history taken from a patient presenting with suspected dysphagia is extremely valuable in diagnosis. The patient should be questioned about the difficulty in swallowing solid food and fluids, the duration, coughing when eating, frequent throat clearing, repeated efforts to swallow, voice changes, the feeling of something stuck in the throat, food selectivity, atypical respiratory periods, weight loss, and recent pneumonia. Some psychopharmacological drugs such as anti-epileptics, antipsychotics and antidepressants can cause weight gain in the elderly, and therefore, as there will be no change in body mass index in the early period, it should not be thought that there is no swallowing disorder, and the diagnosis should not be overlooked.

Solid food dysphagia, food regurgitation, halitosis, and post-prandial or night-time cough can be observed in cases with Zenker diverticulum. When taking the patient history, cognitive functions and mobility status must be recorded.

After a detailed history, a complete ear, nose, and throat examination and head-neck examination must be performed, and when necessary other departments must be consulted. In the oral examination, lip movements, symmetry and closure, oral hygiene, the presence of teeth, soft palate and tongue movements, and symmetry are evaluated. In the endoscopic laryngopharynx examination, detailed evaluation is made of velopharyngeal closure, vocal cord movements during phonation and midline coverage pattern, secretion status in the laryngeal vestibule and the status of remnants in the posterior pharyngeal wall, piriform sinuses, and vallecula. In the head-neck examination, neck position, the presence of any space-occupying mass, and laryngeal elevation during swallowing should be assessed.

Various measurement questionnaires, which are helpful in diagnosis, rapid to apply, simple and low-cost, are useful in the determination of patients at risk. One of these is the Eating Assessment Tool (EAT10), which is a screening scale with proven validity and reliability of 10 items showing the severity of swallowing disorder (27). A score of ≥2 is accepted as abnormal, and the scale has 89% sensitivity and 82% specificity in oropharyngeal dysphagia (28). The Mann Assessment of Swallowing Ability (MASA) is a multidirectional evaluation under 24 subheadings (29). The Swallowing Disturbance Questionnaire is a self-reported scale to determine the swallowing disorder experienced by patients because of various aetiologies. The scale includes 15 items and has 79.7% sensitivity and 73% specificity (30).

There are also bedside tests that can be applied by the clinician. In clinical tests applied bedside using an oximeter with water or different textures, cough, voice changes, choking, and desaturation oropharyngeal dysphagia can be determined in patients (31). In the Yale swallowing test, after evaluation of cognitive functions and the oral structures, the patient is instructed to drink 90 cc water in one go without stopping, and cough, choking, or the need to rest while drinking the water are interpreted as findings of aspiration. Another important clinical test is the Volume-Viscosity Swallowing Test (V-VST). In this test, 5-20 ml water and then food prepared in the form of nectar and milk pudding texture are given consecutively to the patient, during which the efficacy and safety of swallowing is evaluated (28, 32). Cough, a fall in oxygen saturation of ≤3%, and voice change are signs of reduced safety, and lip closure, repeated swallowing, and oral or pharyngeal residue indicate reduced efficacy. The V-VST has 94% sensitivity and 88% specificity in oropharyngeal dysphagia, 91% sensitivity in aspiration, and 79% sensitivity in showing decreased efficacy, and is therefore a rapid and reliable test (28).

In the diagnosis of swallowing disorder, the Fibreoptic Endoscopic Swallowing Study (FESS) and Video Fluoroscopic Swallowing Study (VFSS) are accepted as the gold standard. Before the selection of instrumental evaluation, the cognitive functions and general health status of the patient must be taken into consideration.

The European Society of Swallowing Disorders has reported the need to perform the FESS or VFSS in patients with complaints of swallowing disorder or insufficient airway protection determined in the clinical evaluation (33). FESS can be comfortably performed under polyclinic conditions, is repeatable, can be comfortably tolerated by patients, and can be applied bedside under ICU conditions. First, the anatomic structures are evaluated via the transnasal route with a flexible endoscope, then foodstuffs of various textures and stained with food colouring are given singly and consecutively to the patient, and the swallowing function is observed. The patient is evaluated in respect of reflex trigger time, residue, regurgitation, penetration, and aspiration. Penetration and aspiration are scored using the Penetration Aspiration Scale (PAS) in which 1 point corresponds to normal swallowing and 8 points to total aspiration**.**

Laryngeal sensory evaluation can be made with endoscopic examination. In the VFSS, all the phases of swallowing, cricopharyngeal sphincter anomalies, and potential vertebral structural defects are evaluated. Foodstuffs prepared in various consistencies are mixed with radio-opaque material, then given singly and consecutively to the patient, and real-time consecutive images are obtained during this procedure. Lateral and anterior-posterior imaging is performed. Teamwork with the radiology department is required. However, there are the disadvantages of radiation risk, that it is a time-consuming procedure, costs, and problems of patient positioning. If dysphagia of oesophageal causes is suspected, an oesophagram is another diagnostic tool, and if there is thought to be upper and lower oesophageal sphincter dysfunction, a manometer can be used.

Treatment

The aim of treatment is to be able to nourish the patient safely by preventing aspiration, malnutrition and associated complications. A multidisciplinary approach in dysphagia management is important to obtain successful results in diagnosis and treatment. This team should include ear, nose and throat, chest diseases, gastroenterology, and neurology physicians, a voice-speech-swallowing disorders therapist, and a dietician. For patients who will continue with oral nutrition, a series of general recommendations are important for safe swallowing. It must be explained to patients that they should eat small amounts slowly in an upright position, not eat different textures at the same time, should only concentrate on swallowing, avoid distractions when eating, eat in a quiet environment, drink water after the food to clear potential residue or coughing, use sauce and binding agents to be able to create an appropriate bolus formation, and not to lie down for at least 30 mins after eating to prevent gastroesophageal reflux. Daily intake of ≥30 kcal/kg energy and ≥1.2g/kg protein significantly increases tongue strength (34) and therefore, sarcopenic patients in particular must be evaluated in a nutritional sense and supplemented if necessary.

Poor oral hygiene is a risk factor for pneumonia in elderly patients. The best approach to reduce the incidence of aspiration pneumonia is to brush the teeth after every meal, clean dental prostheses once a day, and have regular dental check-ups (35). In addition to brushing the teeth with toothpaste, chlorhexidine mouthwash solutions that do not contain ethanol provide good results (35,36). Although chlorhexidine is the most effective, these solutions should be used for at least 3 days and no longer than 15 days (37-38). Smokers are recommended to stop smoking. Sufficient pulmonary drainage can be obtained by reducing the time spent in bed and increasing physical activity, and to prevent reflux-related aspiration, the patient should sit upright, especially for a period after eating.

After the general recommendations, treatments can be dealt with under the two main headings of conservative methods and surgical methods.

Conservative methods include bolus modification and swallowing therapies. Bolus modification is the most basic compensatory approach and is recommended when oral nutrition is appropriate but close follow-up is needed for foods of certain textures. The foods should be attractive to the patient, and rich in protein, vitamins, and trace elements. The patient should not be forced to eat but encouraged. Thickening agents for liquids are often used in hospitals and home care services, as thickened liquids can be controlled more easily by the patient. In this way, laryngeal vestibular penetration and aspiration to the tracheobronchial system are reduced (39-41). Patient compliance is reduced to 48-56% if they do not like the texture or taste of the food, or if they must make a greater effort to swallow (42). The lower the viscosity, then the higher the compliance, and fine viscosities such as nectar consistency are well tolerated by patients (43). However, lower fluid intake because of low patient compliance can increase the risk of dehydration (44). Although there is little evidence related to the positive contribution of thickeners to the nutritional status of patients and prevention of pneumonia, it continues to be one of the important strategies in dysphagia management. An alternative approach to the thickening of thin liquids may be the “water free” protocol. However, this protocol should be avoided in patients with degenerative neurological disease, medical instability, severe cough reflex to water, insufficient cognitive functions, oral dental infection, and those who are immobile or cannot sit in a fully upright position (45). In this protocol, water should be drunk between meals, at least 30 mins after a meal and when the mouth is clean. Oral and dental care is important to avoid pulmonary complications, and therefore oral care must be performed before water intake. Drugs taken orally should not be taken in this way with water. Although the level of evidence is low, the “free water” protocol has not shown an increase in pulmonary complications, quality of life related to swallowing difficulty has increased, and there has been shown to be an increase in fluid intake (45). When oral intake does not meet the daily calorie requirement, oral nutrition solutions should be recommended. The compliance of patients in the community and in hospital with oral nutrition solutions has been reported to be 78% (46).

In patients who cannot take a sufficient volume of daily intake orally, high calorie products which can be consumed in smaller amounts should be selected, and patients should be encouraged by clinicians about food consumption. In patients who cannot take nutrition orally or cannot take in sufficient, enteral nutrition via a nasogastric tube, gastrostomy, or jejunostomy can be applied. Nasogastric tube feeding is recommended for patients with acute dysphagia with a good prognosis (47). It is appropriate for short-term use in patients who are not at risk of gastroesophageal reflux. Percutaneous gastrostomy (PEG) is recommended for patients with chronic or progressive disease and those who require long-term (>4-6 weeks) enteral nutrition (48). However, the opening of PEG does not prevent aspiration pneumonia, does not reduce pressure sores, and does not improve survival and functions (50). Therefore, the decision for PEG opening must be a multidisciplinary decision made according to each patient. In a meta-analysis of advanced dementia patients by Lee et al., tube feeding was reported to increase the risk of tube-related complications and mortality, and not increase survival or the nutritional status of the patient, so it was recommended that the decision for tube feeding should be made mutually by the clinician and the patient’s family (51).

Swallowing disorder therapies include compensatory methods and exercises. Compensatory methods include postures and manoeuvres which will safely advance the food bolus along the swallowing pathway with biomechanical adjustments (Table 2).

Table 2. Compensatory methods for swallowing disorder

POSTURE	
Head forward, chin down	The most frequently used posture. The distance between the tongue root and pharyngeal wall is narrowed, and the airway is protected.
Chin up	The bolus is advanced to the pharynx with the effect of gravity. It is used in patients with a problem in the oral transit of the bolus (those with tongue resection because of malignancy or with neurological tongue movement problem)
Head rotation	It is used in unilateral pharyngeal wall paresis/paralysis or unilateral laryngeal paralysis. By closing the affected side in the pharynx, the bolus is directed to the healthy side.
Head side lateral	In same side oral and pharyngeal function disorders, by bending the head towards the healthy side, the bolus is directed to that side.
Lying down	This used in bilateral pharyngeal damage or in reduced laryngeal elevation. Benefit is obtained from gravity.

Table 3. Swallowing manoeuvres

SWALLOWING MANOEUVRES	
Superglottic swallowing	The patient takes a deep breath, swallows the bolus while holding the breath, coughs and then breathes in. In this way the vocal cords remain closed before, during and after the swallow, the airway is protected, and residue aspiration is prevented.
Super-supraglottic swallowing	The patient takes a deep breath and swallows the bolus using extra effort while holding the breath, then coughs and takes another breath. The extra effort allows the airway to remain closed for longer. The airway is closed at the level of pseudo vocal folds and the arytenoid cartilages tilt towards the epiglottis.
Forced swallowing	It is aimed to advance the bolus by strongly contracting the swallowing muscles during swallowing, thereby increasing the thrust of the tongue root.
Mendelson manoeuvre	The patient brings the larynx to the highest level possible, holds it for a few seconds then swallows. The upper oesophageal sphincter opening increases and prolongs the period.

All these posture and swallowing manoeuvres can be given in a combined form (Table 3). The aim of swallowing exercises is to work and strengthen specific muscle groups. The effects are not seen immediately, and the effect of each exercise emerges in 1-6 weeks (52). The exercises are patient specific. In sarcopenic dysphagia, tongue, tongue resistance exercises, and respiratory exercises are applied (53). In tongue resistance exercises, the tongue is pushed strongly onto the hard palate for 10 seconds while the lips are closed, then rested for 10 seconds. Joint range of movement exercises are movements applied to the joints in all directions. These are recommended especially for patients who have undergone head-neck radiotherapy or surgery. Tongue, lips, jaw, and larynx-hyoid movements are increased. Each structure is stretched as far as possible in every direction and each position is held for a certain time. Shaker exercises increase hyolaryngeal elevation and upper oesophageal sphincter opening. The patient lies on the floor then raises the head without raising the shoulders from the floor until the ends of the feet can be seen and remains in this position for a certain time. The same movement is made raising and lowering the head. As this exercise is time-consuming and can be excessively tiring for patients of advanced age, similar benefit can be obtained by working against resistance with the placement of a rubber ball under the chin. In the Masako manoeuvre, the tongue is pushed outwards and squeezed between the anterior teeth, and swallowing is made during this. In this way the glossopharyngeus muscle, which connects the tongue root with the pharyngeal wall, is worked.

Surgery can be planned because of Zenker diverticulum or obstructive reasons such as cricopharyngeal dysfunction at the level of the upper oesophageal sphincter, but the surgical method must be decided according to the risk of aspiration pneumonia and level of malnutrition of the patients and comorbid diseases that could cause complications. Success in the treatment of cricopharyngeal dysfunction increases as the invasiveness of the method increases, in other words, myotomy results are better compared to dilatation and injection results. More minimally invasive methods can be preferred in patients who are not suitable for general anaesthesia. In recent years, procedures such as diagnostic and therapeutic laryngeal botulinum toxin injections, and transnasal laryngo-oesophagoscopic procedures such as oesophageal dilatation have been able to be applied by otorhinolaryngologists under office conditions. In the electromyography guidelines, laryngeal injections can be made without the need for sedation.

In cases of Zenker diverticulum, an open or endoscopic approach can be planned according to the experience and preference of the surgeon, the diverticulum size, and the anatomy and the comorbidities of the patient.

In recent years, techniques such as intrapharyngeal or transcutaneous electrical stimulation, repetitive transcranial magnetic stimulation, or transcranial direct current stimulation, or medications which stimulate swallowing such as transient receptor potential vaniloid 1 (TRPV1) agonist (54) have been used in swallowing disorders, but there are insufficient data and studies of sarcopenic patients. There are also studies in literature related to the efficacy of aromatherapies on swallowing, and it has been reported that in elderly patients requiring home care, inhalation of volatile black pepper oil shortens swallowing reflex latency and causes an increase in swallowing movements and cerebral blood flow related to swallowing (55).

CONCLUSION

There is no standard algorithm for swallowing disorders in elderly patients, and the approach is patient specific. However, the awareness of this condition and not seeing it as a natural result of ageing plays a key role in the management of this problem. The treatment plan requires a multidisciplinary approach. Generally, compensatory rehabilitation is effective in treatment, and oral care is extremely important in the prevention of serious complications. The decision for enteral tube feeding must be made with good communication between the clinician and the family and taking the benefits and harm into consideration.

Conflict of interest

No conflict of interest was declared by the author.

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