Elderly dysphagia: our 10-year experience in Presbyesophagus and Primary Presbyphagia

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Authors: F. Barbiera¹, E. Murmura¹, B. Murmura¹, G. Maggio², L. S. Maltese³, M. Accardi¹, F. La Seta², L. La Grutta², M. Midiri²;¹Sciacca/IT, ²Palermo/IT, ³Siena/IT

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Learning objectives

Fig. 4: Woman, 77 years old. Discinetic esophagus, repetitive, non-propulsive peristaltic contractions, tertiary contractions with antiperistaltic waves and esophageal emptying delay

References: UO Radiologia Sciacca AG1

To perform a retrospective evaluation of patients with primary presbyphagia, not related to other comorbidities, who undergone videofluoroscopy swallow study (VFSS) over a
period of 10 years (2004-2013). To assess presbyesophagus incidence, prevalence and associated abnormalities of oral and pharyngeal swallowing in patients over 67 years old.
Background

Difficulty in swallowing is an increasingly common problem in elderly patients: symptoms of dysphagia have been reported in about 5% of the general population aged over 79 years and in 16% of people over 87 years [2] and it is likely that dysphagia will become an even more common problem in the next years. Dysphagia and the increased risk of related complications (aspiration pneumonia, dehydration, malnutrition) should be therefore carefully investigated.

In the elderly, dysphagia can affect both the oropharyngeal and the esophageal phase of swallowing: the term presbyesophagus [4] has been coined to indicate the complex of morpho-functional pharingo-esophageal alterations that can lead to a progressive decline of the elderly swallowing mechanism.

The presbyesophagus is part of the broader framework of anatomical and functional swallowing changes that occur in the elderly, indicated by the term presbyphagia and the digital videofluoroscopy is the first imaging modality in dysphagic patients [5].

In elderly patients, dysphagia may also be caused or worsened by other factors (secondary presbyphagia): the higher prevalence of nervous system diseases (Alzheimer's, Parkinson's and cerebro-vascular disease), the higher incidence of head and neck malignancies, the use of several drugs (opioids, NSAIDs, corticosteroids, etc.) that may induce xerostomia with consequent difficulties in bolus preparation [7, 8].

Several hypotheses have been formulated to explain the occurrence of presbyesophagus and presbyphagia in patients without any other comorbidities: cerebral atrophy, blood flow changes and other age-related conditions are all factors that may be implicated in presbyphagia development. Neuroimaging studies using head magnetic resonance imaging in normal adults have shown a relationship between slower swallowing and both the increased number and severity of periventricular white-matter hyperintensities [9].

The decline in the elderly swallowing mechanism could also be due to sarcopenia, the age-related loss of oral cavity and pharynx muscle mass, organization, and strength which can lead, for example, to decrease in lingual pressure necessary to start the pharyngeal phase of swallowing or to reduce the contractility of the pharyngeal muscles with consequent delayed pharyngeal transit time and intraluminal bolus stasis [7,10]. Alterations of the oral phase may be associated with a reduction in oral and pharyngeal sensitivity, with subsequent delay in triggering of the swallowing reflex [11]. The anatomic and/or functional alterations of tongue muscles can lead to a defective closure of the
palate-lingual isthmus, with early fall of the contrast medium into the pharynx or leak of the contrast medium in the rhino-pharynx with nasal regurgitation during swallowing [7,11].

The alterations of pharyngeal phase may be of greater clinical significance because of airway aspiration's risk. To avoid this risk, the adult has an excess of strength and coordination (swallowing reserve) which is significantly reduced in the elderly, more susceptible to external stress. So, aging delays pharyngeal swallowing, and multiple swallows are required to clear a bolus from the pharynx in healthy elderly subjects [12].

Furthermore, in the elderly the pharyngeal and laryngeal events (including laryngeal vestibule closure, maximal hyoid-laryngeal excursion, and upper esophageal sphincter opening) is significantly slower than in young adults. So, in the elderly, the probability of laryngeal penetration is increased and, because of the reduced pharyngo-laryngeal sensibility, silent aspiration may occur, with a higher risk of lung infections [10, 13].

In the elderly patients, the alterations of the esophageal phase can affect peristalsis, and upper and/or lower esophageal sphincter function [14, 20].

The genesis of presbyphagia and presbyesophagus is therefore multifactorial, and we can found several causes in many physio-pathological processes age-related [21].

The VFSS is universally considered the gold standard test for swallowing examination for the possibility to explore all phases of swallowing, and to recognize the alterations of the normal physiology and the presence of bolus aspiration in the airways. Moreover, the easy execution and the wide availability of low-cost equipment, make VFSS the best examination for evaluating the dysphagic patients. The early recognition of changes in swallowing and of esophageal disorders in the elderly patient, allows to confirm the diagnosis of dysphagia without invasive testing (like endoscopy), and especially to implement those devices (dietary, postural rehabilitation, speech therapy) that may enable a better quality of life and a strong reduction of serious pulmonary complications. The VFSS examination helps to identify not only the conditions causing dysphagia, but also allows a safe and easy evaluation of the upper digestive tract and a perfect assessment of changes both in the oro-pharyngeal and esophageal phase of swallowing, as demonstrated in our study.

We retrospectively reviewed 530 VFSS (from 2004 to 2013) of dysphagic outpatients (67-91 years old). Inclusion criteria were predefined as follows: patients with primary presbyesophagus (only outpatients for this reason) and over 67 years old (youngest patient was 67); examinations requested for dysphagia and/or gastro-esophageal reflux symptoms (heartburn, cough, pharyngeal globe sensation); presence of functional disorders of pharingo-esophageal tract, hiatal hernia and/or gastro-esophageal reflux
(spontaneous and/or during the water siphon test). Exclusion criteria were predefined as follows: patients under than 67 years old; patients with present and/or past neuromuscular diseases (e.g. stroke, Parkinson disease, etc. ...); hospitalized patients (due to possible comorbidity causing dysphagia)

The patients were examined with a standard technique using a digital fluoroscopy system, evaluating the presence of alterations of oral, pharyngeal and esophageal phases, penetration/aspiration (associated or not to reflexive cough), hiatal hernia or gastroesophageal reflux.

We diagnosed a presbyesophagus when the radiologic evaluation of the esophagus showed: repetitive, non-propulsive peristaltic contractions; tertiary contractions with antiperistaltic waves both in orthostasis and in clinostasis; deficiency in normal clearing; slower esophageal bolus transit; esophageal emptying delay; intraluminal stasis.
Among 530 patients (67-91 years old; mean age 78.8 years), were identified 57 patients (10.75%) affected by presbyesophagus with primary dysphagia with an incidence of 10.75%; there was not a sex predominance (28 men and 29 women).

13/57 patients (22.8%) had also oral phase's alterations.

33 out of 57 patients (57.9%) with presbyesophagus had also pharyngeal phase's alterations; in this group of patients, silent penetration/aspiration were present in 32/33 cases (Fig.1, 2).

7 patients (12.3%) had hypertonic cricopharyngeal muscles at the pharyngo-esophageal junction.

In addition, we documented oropharyngeal, hypopharyngeal or esophageal diverticula in 6 patients (10.5%).

In 36 patients, we also found sliding hiatal hernia.

Finally, 9/57 patients with presbyesophagus (15.8%; 8 males and 1 female between the ages of 72 and 89 years and mean age of 78.3 years) showed alterations of the oral, pharyngeal and esophageal swallowing phases at the same time.
Images for this section:

Fig. 1: Woman, 77 years old. Delayed pharyngeal transit time and intraluminal bolus stasis

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Fig. 2: Man, 80 years old. Barium penetration (arrow)

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**Fig. 3:** Man, 78 years old. Pharyngeal stasis with aspiration

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**Fig. 4:** Woman, 77 years old. Discinetic esophagus, repetitive, non-propulsive peristaltic contractions, tertiary contractions with antiperistaltic waves and esophageal emptying delay

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**Fig. 5:** Man, 80 years old. Dynamic sequences acquired in later-lateral projection focused on the pharynx with liquid barium. Alteration of pharyngeal phase: barium penetration until the laryngeal ventricle without reflexive cough - ("silent penetration")

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Fig. 6: Man, 80 years old (the same patient in Fig.5): Dynamic sequences acquired in later-lateral projection focused on the pharynx with fluid barium (higher density than Fig.5). Alteration of pharyngeal phase: reduced constrictors muscles contractility with pharyngeal hypotonia, barium penetration and aspiration, without reflexive cough - ("silent aspiration")

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Conclusion

Approximately 10% of over 67 years old dysphagic patients has got presbyesophagus. It is associated, in order of prevalence, with alterations of pharyngeal or oral phase, or both of them.

Our experience confirm that barium study with digital fluoroscopy remain the first examination to be performed in elderly patients with dysphagia.
References


