Many neurologic diseases may affect the neural structures controlling and directing the complex mechanisms of oropharyngeal deglutition (neurogenic dysphagia). The prevalence of oropharyngeal disturbances in patients with neurologic and age-related disease is extremely high and little known. More than 30% of patients having suffered from a cerebrovascular accident; 52-82% of patients with Parkinson's disease; virtually 100% of patients with amyotrophic lateral sclerosis; 44% of patients with multiple sclerosis; 84% of patients with Alzheimer’s disease, and more than 60% of institutionalized elderly people have functional oropharyngeal dysphagia (1-4). The incidence of altered deglutition following a brain-skull trauma (BST) has not been thoroughly studied. The specific literature provides an incidence between 25% and 61% in patients admitted for rehabilitation (1-6).

Functional oropharyngeal dysphagia has a great social impact –it is estimated that in 2010 16,500,000 pensioners in the US will require specific care for dysphagia (7). The severity of disordered pharyngeal motility may result in two classes of severe clinical complications: a) up to 25-75% of patients with dysphagia have malnutrition and/or dehydration; b) 30-50% have tracheobronchial aspiration, which leads to pneumonia in 50% of cases, with an associated mortality rate up to 50% (8,9). The progressive ageing of our society has increased by 93.5% the rate of aspiration pneumonia among the elderly in the past 10 years, while other types of pneumonia have significantly decreased (7,10). In most of our hospitals there is a marked discrepancy between the high morbidity, mortality, and high healthcare costs as a result of functional oropharyngeal dysphagia complications, and the scarcity of both material and human resources devoted to this condition.

Most symptoms and complications deriving from neurologic dysphagia result from a sensitive-motor disturbance of deglutition’s oral and pharyngeal phases. Neurologic alterations are rarely restricted to the deglutition’s control area exclusively, and the involvement of other nervous system areas will bring about other neurologic complaints in association with dysphagia, which will complicate the clinical picture. In addition, some therapeutic procedures such as orotracheal intubation and tracheostomy cannulas may represent additional difficulties (11). Hence the diagnosis and therapy of this condition requires a multidisciplinary approach including nurses, logopedists, internists, gastroenterologists, gerontologists, gut surgeons, rehabilitators, radiologists, nutritionists, ENT specialists, etc. (12). The primary goals of this team should include: a) early identification of patients at risk of dysphagia and/or aspiration; b) a diagnosis of any medical or surgical condition responsible for dysphagia that has a specific treatment, and exclusion of any structural cause of dysphagia; c) a characterization of oropharyngeal motor response changes using functional examinations such as videofluoroscopy and pharyngoesophageal manometry; and d) a selection of therapeutic strategies most appropriate
to achieve a safe, effective deglutition, or the indication of feeding route other than oral—nearly always a percutaneous endoscopic gastrostomy—based on objective, reproducible signs (8,9).

Functional oropharyngeal dysphagia is a scarcely assessed and studied clinical complaint despite the availability of specific diagnostic methods, including videofluoroscopy and pharyngoesophageal manometry (9). Videofluoroscopy (VFS) is considered the “gold standard” technique in the study of oropharyngeal mechanisms leading to functional dysphagia (8,9,13,14). VFS is a dynamic radiographic exploration allowing to detect deglutition’s primary disturbances as videofluoroscopic signs (15). VFS technical requirements are simple—an X-ray tube with videofluoroscopy, and a video recorder—and available in most of our health centers (12). In addition, a variety of computer-assisted analysis methods have been developed that allow spatial and temporal quantitative measurements of oropharyngeal motor response (16,17). The goals of videofluoroscopy include the assessment of efficacy and safety during deglutition, a characterization of deglutition disturbances, an evaluation of therapy effectiveness, and the collection of quantitative data for oropharyngeal biomechanics (15). VFS signs affecting deglutition efficacy, including deglutitional apraxia, lingual control and propulsion changes, oropharyngeal residue, upper sphincter aperture disturbances, etc., may ultimately reduce oral feeding and result in malnutrition. Up to 30% of neurologic patients and 80% of “frail” elderly patients have malnutrition associated with dysphagia (15-17). The main signs in VFS pointing at impaired deglutition safety include contrast entering the laryngeal vestibulum and aspiration (contrast passes beyond the vocal cords and enters the airway). Up to 40% of patients with neurogenic dysphagia have aspiration, half of them silent (with no cough associated) and therefore only identifiable by systematically applying this technique. VFS allows to establish the time in the deglutitional cycle where aspiration occurs—85% during the pharyngeal phase—and whether aspiration is associated with an impaired “oropharyngeal motor response”. Oropharyngeal motor response during deglutition is a little known digestive reflex. It includes two major sets of events: a) a rapid oropharyngeal reconfiguration from a resting airway to a digestive tract—basically by the closure of the laryngeal vestibulum and aperture of the upper esophageal sphincter; and b) strong bolus propulsion by the tongue (7,8,17). VFS allows to identify and quantitate most of these elements. Recent studies have demonstrated that disturbed strength during lingual propulsion is the main factor responsible for ineffective deglutition (17), and that major impairments leading to aspiration include a slow initial phase of oropharyngeal reconfiguration (17,18), and disturbed airway protection mechanisms (hyoid and laryngeal elevation, epiglottal descent, and vocal cord closure) (8). On the other hand, assessing upper sphincter aperture mechanisms on occasion requires combined studies with VFS and manometry. Manometry allows to assess intrabolus pressure (compliance indirectly), and the relaxation (but not the aperture) and contraction of UES, whereas VFS will inform on hyoid traction movements, UES aperture, and lingual propulsion (19). The best results for cricopharyngeal myotomy are obtained in patients with incomplete aperture on VFS and decreased sphincter compliance during manometry, who also show a wholly preserved oropharyngeal motor response (rapid oropharyngeal reconfiguration, strong lingual propulsion, and wide hyoid movement) (19). In the upcoming future advances in medical technology will provide methods for the study of oropharyngeal physiology based on automated videofluoroscopic parameter acquisition and the introduction of new tools such as high-definition manometry.
This issue of Revista Española de Enfermedades Digestivas includes an interesting study on the videofluoroscopic quantitation of oropharyngeal dysphagia secondary to traumatic brain injury. The authors establish the clinical usefulness of videofluoroscopy, show the high rate of deglutition impairment in patients with severe BST (65% in the oral phase, 73% in the pharyngeal phase), and identify 90% of patients with aspiration—mostly silent, clinically undetected events—during the pharyngeal phase despite preserved quantitative parameters defining deglutition’s pharyngeal phase (20). In contrast to patients with dysphagia associated with neurodegenerative disease and ageing, the natural history of dysphagia in patients with BST is benign, but a number of studies confirm that the presence of impaired deglutition prolongs hospital stay (21).

The application of therapy programs to patients with oropharyngeal dysphagia has been seen to correlate with a relevant decrease in aspiration pneumonia rates and improved nutritional status. Treatment may include changes in bolus volume and viscosity, postural strategies, oropharyngeal praxies and active maneuvers, and rehabilitation procedures (9,22). The highest level of therapeutic evidence corresponds to increased bolus viscosity, which results in so much a dramatic reduction of aspiration that its systematic use has even recommended for patients at risk for aspiration (8-10,16). Patients with disturbed deglutition efficacy must have their calorie and protein requirements adjusted to the volumes they can swallow to prevent nutritional risks. A recent resolution by the Council of Europe regarding nutritional care in our hospitals emphasizes the negative effect of malnutrition on prolonged hospital stay and rehabilitation requirements, on reduced quality of life, and on increased health costs, and recommends that functional oropharyngeal dysphagia be considered an important nutritional risk factor (23). Very recent studies suggest an immediate development of pharmacological tools for the stimulation of oropharyngeal motor response.

The recognition of functional oropharyngeal dysphagia as a specific neurologic and geriatric syndrome will induce many changes in medical and social service delivery in the near future. Health professional education on the diagnosis and treatment of dysphagia and related complications, the development of clinical screening methods for early diagnosis, the development of specific diagnostic tests in the clinical setting, the development of dietary strategies to prevent aspiration and malnutrition, and research on dysphagia-related pathophysiology, pharmacology, and natural history in every involved condition represent the cornerstones required to allow a maximum recovery potential for patients with functional oropharyngeal dysphagia.

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