

Short Communication

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Author for correspondence:

Dr C Martin-Gonzalez, ENT Department, Infanta Sofia University Hospital, Paseo de Europa 34, 28703 San Sebastián de los Reyes, Madrid, Spain
E-mail: c.martin.gonzalez@facultyue.es

Oropharyngeal dysphagia in head and neck cancer: how to reduce aspiration pneumonia

C Martin-Gonzalez^{1,2} , M J Gonzalez-Gimeno^{1,2}, B De-Frutos-Hernan² and C Valor-Garcia¹

¹ENT Department, European University of Madrid and ²Infanta Sofia and Henares Hospitals Foundation for Biomedical Research and Innovation, Madrid, Spain

Abstract

Objective. Oropharyngeal dysphagia is caused by difficulty in bolus preparation and transport from the mouth to the oesophagus; this may result in malnutrition and aspiration pneumonia. It has a high prevalence in head and neck cancer patients. The objective of this study is to reduce these complications using a new protocol of diagnosis and evaluation of oropharyngeal dysphagia.

Method. This is a prospective study developed in a secondary hospital. All patients diagnosed with head and neck cancer in 2021 and 2022 are subjected to this protocol: an oropharyngeal dysphagia screening test, a swallowing-related quality of life questionnaire and a flexible endoscopic evaluation of swallow.

Results. A total of 72 evaluations are reported using this protocol, before and after cancer treatment, and only 1 presents with aspiration pneumonia.

Conclusion. Using this protocol, the incidence of aspiration pneumonia can be reduced, and diet recommendations can be given earlier in order to maintain a patient's nutritional requirements.

Introduction

Oropharyngeal dysphagia is caused by difficulty in bolus preparation and transport from the mouth to the oesophagus, which alters the efficiency and/or the safety of swallowing. Its consequences are malnutrition and aspiration pneumonia, which has a high mortality rate.¹

Head and neck cancer patients have a high oropharyngeal dysphagia prevalence¹ related to different causes. They usually have a painful swallow. There is a direct impact of tumour size and location in bolus progression throughout the upper digestive tract.

The presence of a tracheostomy impairs swallowing. It reduces sensory input and subglottic air pressure and induces laryngeal structure disuse atrophy, all of which may increase the risk of aspiration.² There are side effects with regard to cancer treatment. Surgery produces fibrosis and structural changes in the upper aerodigestive tract. Chemoradiation therapy is associated with a painful inflammation, oral and pharynx mucositis³ and xerostomia, peripheral neuropathy, and muscular fibrosis.^{4,5} In cases of severe oropharyngeal dysphagia, oral feeding is not possible, and it is necessary to place a feeding tube or a gastrostomy.

Oropharyngeal dysphagia induces a decreased quality of life (QoL) in these patients, interfering with their social relationships and the pleasure of eating⁵ and is even worse if they have a tracheostomy.

Oropharyngeal dysphagia evaluation allows establishment of a safe feeding pattern that reduces the risks of aspiration and malnutrition, which are associated with a worse QoL and reduced immune response and tolerance to antineoplastic treatment and survival, in addition to increased post-operative complications, hospital stay and costs.⁶

Aspiration pneumonia is a severe complication of oropharyngeal dysphagia, which requires antibiotics and a long-term hospital stay, and it may be lethal. Aspiration pneumonia is probably the most important factor contributing to non-cancer and unknown deaths in head and neck cancer patients.⁷ Therefore, we suggest that a diagnosis and evaluation protocol of oropharyngeal dysphagia in head and neck cancer patients is highly recommended.

Materials and methods

Patients diagnosed with head and neck cancer are evaluated at our oropharyngeal dysphagia unit, before and after cancer treatment. They all must give written informed consent in order to participate in this protocol. A dissociated database is employed, so there is no personal data that would identify patients. The Research Committee of Infanta Sofia University Hospital and the Ethics and Research Committee of La Paz University Hospital approved this study.

1- Mi problema para tragar me ha llevado a perder peso.	0	1	2	3	4
2- Mi capacidad para tragar interfiere con mi capacidad para comer fuera de casa.	0	1	2	3	4
3- Tragar líquidos me supone un esfuerzo extra.	0	1	2	3	4
4- Tragar sólidos me supone un esfuerzo extra.	0	1	2	3	4
5- Tragar pastillas me supone un esfuerzo extra.	0	1	2	3	4
6- Tragar es doloroso.	0	1	2	3	4
7- El placer de comer se ve afectado por mi problema para tragar.	0	1	2	3	4
8- Cuando como la comida se me queda pegada a la garganta.	0	1	2	3	4
9- Toso cuando como.	0	1	2	3	4
10- Tragar es estresante.	0	1	2	3	4
TOTAL:					

Fig. 1. Eating Assessment Tool-10 (Spanish version).

Patients must answer a screening questionnaire about oropharyngeal dysphagia. We use the Eating Assessment Tool-10, which is validated in Spanish.⁸ It is a self-administered, reliable questionnaire published by Belafsky *et al.* in 2008.⁹ It has 10 items that have to be scored from 0 (there is no problem) to 4 (there is a serious problem). The scores are added together, and a global score of 3 or more indicates that oropharyngeal dysphagia may be present (Figure 1).

In addition, patients must fill in a swallowing-related QoL questionnaire. We used the MD Anderson Dysphagia Inventory, which is validated in the Spanish head and neck cancer population.¹⁰ Chen *et al.* published this self-administered, psychometrically validated and reliable questionnaire in 2001.¹¹ It has 20 items divided into 4 domains: the global domain (1 item) that summarises the overall QoL aspects related to swallowing; the emotional domain (6 items) that measures the emotional response to dysphagia; the functional domain (5 items) that evaluates the effect of dysphagia in daily activity; and the physical domain (8 items) that indicates the self-perception of swallowing difficulties.¹⁰ Each item scores from 1 (strongly agree) to 5 (strongly disagree) while the global domain is shown separately. The composite score is obtained by adding the score of the last 3 domains, calculating their mean and multiplying this by 20. So, the composite score ranges from 20 (extremely low functioning) to 100 (high functioning).¹⁰ A score of 80 or more indicates minimal or no swallowing problems¹² (Figure 2). Hutcheson *et al.* demonstrated that the composite score shows less variability and a more consistent performance across clinical anchors of swallowing function.¹³ Thus, the global domain that has only 1-item is used alone in order to obtain a quick view of the patient's swallow situation. Patients are then subjected to a complete

otorhinolaryngological exploration in order to find any structural and/or functional impairment.

The last step is a flexible endoscopic evaluation of swallow. Patients swallow water dyed with food colouring and thickened with different amounts of food thickener according to the International Dysphagia Diet Standardization Initiative.¹⁴ Flexible endoscopic evaluation of swallow follows the Volume-Viscosity Swallow Test protocol.¹⁵

Flexible endoscopic evaluation of swallow data about efficiency and safety are classified according to the Dynamic Imaging Grade of Swallowing Toxicity for flexible endoscopic evaluation of swallow.¹⁶ This is developed based on the video-fluoroscopic Dynamic Imaging Grade of Swallowing Toxicity™,¹⁷ including the use of the Penetration Aspiration Scale¹⁸ to determine Dynamic Imaging Grade of Swallowing Toxicity-flexible endoscopic evaluation of swallow safety grades and the measurement of the percentage of pharyngeal residue to determine Dynamic Imaging Grade of Swallowing Toxicity-flexible endoscopic evaluation of swallow efficiency grades. The composite score is obtained by the interaction of the safety and efficiency grades. It ranges from 1 (mild) to 4 (life threatening) (Figure 3).

The composite oropharyngeal dysphagia features are classified according to the Dysphagia Outcome and Severity Scale.^{19,20} It is a 7-point rating scale, which measures oropharyngeal dysphagia severity based on videofluoroscopic swallow study. It makes recommendations for nutrition level, diet and independence¹⁹ (Table 1). Based on flexible endoscopic evaluation of swallow findings, patients receive recommendations about swallowing and diet adaptation in order to reduce the risk of aspiration and to maintain nutritional and hydration requirements. If necessary, a feeding tube is placed. Patients are sent to a speech and language pathologist if oropharyngeal dysphagia rehabilitation is required.

CUESTIONARIO DE EVALUACION DE LA CALIDAD DE VIDA EN PACIENTES CON DISFAGIA. POR FAVOR PUNTÚE EL GRADO DE CONFORMIDAD EN CADA APARTADO RODEANDO SOLO UN NÚMERO DE CADA LINEA.

Muy de acuerdo =1 De acuerdo =2 Sin opinión=3 En desacuerdo =4 Muy en desacuerdo=5

G. Mis dificultades al tragar limitan mis actividades diarias	1	2	3	4	5
E2. Me avergüenzan mis hábitos comiendo	1	2	3	4	5
F1. La gente suele tener dificultades cuando cocina para mí	1	2	3	4	5
P2. Me cuesta más tragar al final del día	1	2	3	4	5
E7. Me reprimo/siento acomplejado cuando como	1	2	3	4	5
E4. Me siento a disgusto con mi problema a la hora de tragar	1	2	3	4	5
P6. Me cuesta mucho tragar	1	2	3	4	5
E5. No salgo debido a mis problemas para tragar	1	2	3	4	5
F5. Mi dificultad al tragar me ha hecho perder ingresos (ganancias)	1	2	3	4	5
P7. Tardo más tiempo en comer debido a mis problemas al tragar	1	2	3	4	5
P3. La gente me pregunta ¿Por qué no puedes comer eso?	1	2	3	4	5
E3. Otras personas se sienten molestas por mis problemas al comer	1	2	3	4	5
P8. Toso cuando intento beber líquidos	1	2	3	4	5
F3. Mi problema a la hora de tragar limita mi vida social y personal	1	2	3	4	5
F2. Tengo problemas en salir a comer con mis amigos, vecinos y familiares	1	2	3	4	5
P5. Limito la cantidad de comida que consumo por mi dificultad a la hora de tragar	1	2	3	4	5
P1. No puedo mantener mi peso debido a mi problema a la hora de tragar	1	2	3	4	5
E6. Tengo baja autoestima debido a mis problemas de deglución	1	2	3	4	5
P4. Siento como si estuviese tragando una cantidad muy grande de comida	1	2	3	4	5
F4. Me siento excluida/o por mis hábitos al comer	1	2	3	4	5

Fig. 2. MD Anderson Dysphagia Inventory (Spanish version).

Results

Seventy-two studies were evaluated according to the following protocol. Regarding the Eating Assessment Tool-10, 28 questionnaires (38.88 per cent) obtained a score below 3 points, so oropharyngeal dysphagia was ruled out. These 28 reports also reached a high MD Anderson Dysphagia Inventory composite score (over 80 points). Flexible endoscopic evaluation of swallow results disclosed absence of oropharyngeal dysphagia in 25 cases, so they did not need a diet adaptation. A single patient received the recommendation to use thickeners to get an International Dysphagia Diet Standardization Initiative level 1, because Dynamic Imaging Grade of Swallowing Toxicity safety grade was 2. The other two patients were advised to modify their diet but without the need of thickeners.

Forty-four reports (61.11 per cent) presented with oropharyngeal dysphagia according to the Eating Assessment Tool-10, MD Anderson Dysphagia Inventory and flexible endoscopic evaluation of swallow. A diet adaptation with

thickeners was suggested for 5 cases to reach a level 1 and for 2 cases to get a level 3 of the International Dysphagia Diet Standardization Initiative. Recommendations such as eating a soft diet, avoiding sticky and dangerous food (like soup), using small spoons, taking small bites, and providing some kind of surveillance were advised for the rest of the cases.

In five examinations, oral feeding was not recommended, and a feeding tube was placed in four of them. The fifth was in need of parenteral nutrition because of a concurrent digestive pathology that contraindicated enteral nutrition. Only 2 studies out of 72 presented with aspiration pneumonia, but in one case the reason was because the patient refused to use a feeding tube in spite of our recommendation.

Discussion

An early diagnosis of oropharyngeal dysphagia is essential in head and neck cancer patients because of its high prevalence and its dangerous complications, such as aspiration pneumonia.

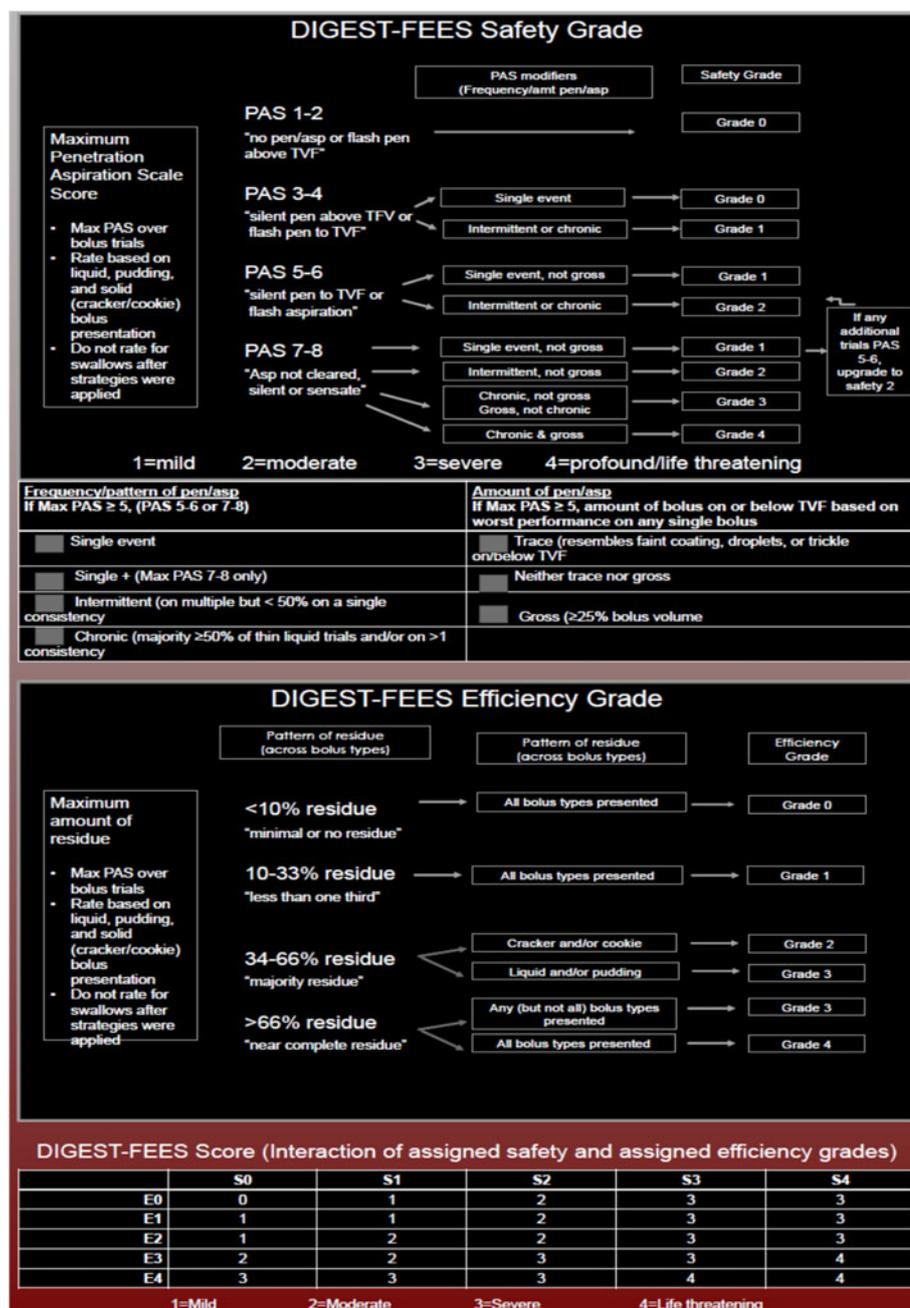


Fig. 3. Dynamic Imaging Grade of Swallowing Toxicity-flexible endoscopic evaluation of swallow (DIGEST-FEES). PAS = Penetration Aspiration Scale; Max = maximum; pen = penetration; asp = aspiration; TVF = true vocal folds

There are a lack of standardised protocols for the diagnosis and evaluation of oropharyngeal dysphagia in head and neck cancer patients. We presented a new protocol that reports the presence of oropharyngeal dysphagia, the QoL related to swallowing and the oropharyngeal dysphagia features regarding aspiration and residue.

There are some publications on the management of oropharyngeal dysphagia, and the systematic reviews agree that there is not a single way to diagnose oropharyngeal dysphagia.^{2,4} There are different oropharyngeal dysphagia-related questionnaires besides the Eating Assessment Tool-10 and MD Anderson Dysphagia Inventory, such as the Functional Oral Intake Scale,²¹ Swallowing Disturbance Questionnaire,²² the Swallowing-Quality of Life Questionnaire²³ or European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Head and Neck-35.²⁴

The oropharyngeal dysphagia diagnosis protocol that we present is very easy to carry out and very useful in the oropharyngeal dysphagia clinic. It only takes 20 minutes to be

completed, and printed material and instrumentation are available in any otorhinolaryngology practice.

A limitation of this protocol is the impossibility of correlating our findings with videofluoroscopic swallow study because this technique is not available at our hospital. We have a radiological examination called ‘oesophagus deglutition function’ that indicates the presence of aspiration and residue, oesophagus mobility, and the presence of gastro-oesophageal reflux.

Conclusion

A protocol for oropharyngeal dysphagia diagnosis and management is necessary because it is such an important and dangerous impairment for head and neck cancer patients that we think it should be implemented at all hospitals. The protocol we present is easy, cheap, fast and available at any hospital, even at the bedside. This protocol uses questionnaires and examinations that are already validated and available

Table 1. Dysphagia Outcome and Severity Scale

Full per-oral nutrition: normal diet
Level 7: normal in all situations
– Normal diet – No strategies or extra time needed
Level 6: within functional limits/modified independence
– Normal diet, functional swallow – Patient may have mild oral or pharyngeal delay, retention or trace epiglottal undercoating but independently and spontaneously compensates/clears – May need extra time for meal – Have no aspiration or penetration across consistencies Full per-oral nutrition: modified diet and/or independence
Level 5: mild dysphagia: distant supervision may need one diet consistency restricted. May exhibit one or more of the following:
– Aspiration of thin liquids only but with strong reflexive cough to clear completely – Airway penetration midway to folds with one or more consistency or to folds with one consistency but clears spontaneously – Retention in pharynx that is cleared spontaneously – Mild oral dysphagia with reduced mastication and/or oral retention that is cleared spontaneously
Level 4: mild-moderate dysphagia: intermittent supervision/cueing, one or two consistencies restricted. May exhibit one or more of the following:
– Retention in pharynx cleared with cue – Retention in the oral cavity that is cleared with cue – Aspiration with one consistency, with weak or no reflexive cough – Or airway penetration to the level of the vocal folds with cough with two consistencies – Or airway penetration to the level of the vocal folds without cough with one consistency
Level 3: moderate dysphagia: total assist, supervision or strategies, two or more diet consistencies restricted. May exhibit one or more of the following:
– Moderate retention in pharynx, cleared with cue – Moderate retention in oral cavity, cleared with cue – Airway penetration to the level of the vocal folds without cough with two or more consistencies – Or aspiration with two consistencies, with weak or no reflexive cough – Or aspiration with one consistency, no cough and airway penetration to folds with one, no cough Non-oral nutrition necessary
Level 2: moderately severe dysphagia: maximum assistance or use of strategies with partial per-oral nutrition only (tolerates at least one consistency safely with total use of strategies). May exhibit one or more of the following:
– Severe retention in pharynx, unable to clear or needs multiple cues – Severe oral stage bolus loss or retention, unable to clear or needs multiple cues – Aspiration with two or more consistencies, no reflexive cough, weak volitional cough – Or aspiration with one or more consistency, no cough and airway penetration to folds with one or more consistency, no cough
Level 1: severe dysphagia: non-per-oral nutrition: unable to tolerate any per-oral nutrition safely. May exhibit one or more of the following:
– Severe retention in pharynx, unable to clear – Severe oral stage bolus loss or retention, unable to clear – Silent aspiration with two or more consistencies, non-functional volitional cough Or unable to achieve swallow

worldwide. Its use can reduce the incidence of oropharyngeal dysphagia complications such as aspiration pneumonia.

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Competing interests. None declared.

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