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Original Article

Long-term Swallow Function after Chemoradiotherapy for Oropharyngeal Cancer: The Influence of a Prophylactic Gastrostomy or Reactive Nasogastric Tube

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Abstract

Aims: Two contrasting approaches of a prophylactic gastrostomy or a nasogastric tube as needed are widely used to support patients receiving chemoradiotherapy for head and neck cancer. The influence of the type and timing of enteral feeding tube support upon long-term swallowing is uncertain. This study analysed the patients' perspective on long-term swallowing, comparing two groups of patients who received chemoradiotherapy for oropharyngeal cancer managed with the two approaches.

Materials and methods: The MD Anderson Dysphagia Inventory (MDADI) was posted to 63 consecutive patients with oropharyngeal squamous cell cancer treated with concurrent chemoradiotherapy between January 2007 and June 2009, who had not required therapeutic enteral feeding before treatment and who were disease free on follow-up at least 2 years after treatment.

Results: In total, 56/63 patients completed questionnaires; 43 had been managed with a prophylactic gastrostomy and 13 with a policy of nasogastric tube as needed. There were no significant differences in all global, emotional, physical or functional domains of the MDADI according to enteral feeding strategy. Diet at 6 months after treatment was significantly correlated with better MDADI scores.

Conclusions: In this study, the choice of a prophylactic gastrostomy or nasogastric tube as needed did not seem to influence long-term swallowing function.

Key words: Chemoradiotherapy; gastrostomy; nasogastric tube; oropharynx cancer; swallow; toxicity

Introduction

Concurrent chemoradiotherapy is the preferred treatment strategy for organ preservation for locally advanced head and neck squamous cell carcinoma (HNSCC). Trials have shown a survival benefit for the addition of concurrent chemotherapy with the cost of increased treatment toxicity [1,2]. Acute treatment-related side-effects of odynophagia, dysphagia, xerostomia and mucositis with associated weight loss are common. A large majority of patients require oral or enteral nutritional supplementation during and after treatment. The proportion of patients reported as requiring enteral feeding varies between reported series, with between 50 and 100% of patients receiving chemoradiotherapy needing enteral nutritional support [3–5]. Risk factors for requiring enteral feeding include pretreatment weight loss and dysphagia, older age, large primary tumours and treatment-related factors, including the use of concurrent chemotherapy and radiation dose to the pharyngeal constrictors [6,7].

Two main approaches have been used to provide enteral nutritional support: (a) prophylactic tube placement before treatment and (b) reactive tube placement if and when required. A gastrostomy tube is usually preferred for the former approach and a nasogastric tube for the latter [6]. A recent UK-based survey revealed no consensus as to which patients should be offered a prophylactic gastrostomy [8]. This remains a contentious area, and both approaches to enteral feeding have advantages and drawbacks. Several

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studies have suggested that the use of prophylactic gastrostomy placement is associated with a reduction in weight loss during treatment, a lower rate of hospitalisation [4,9–11] and improved quality of life during and soon after treatment [12,13]. The disadvantages of prophylactic gastrostomy placement before treatment include the possibility that the tube will not be required, a small risk of tube-related morbidity [14] and the uncertain influence on long-term enteral feeding dependency rates [6,9–11,15].

Long-term swallowing outcomes are an important consideration in choosing the timing and method of providing nutritional support. Long-term swallow function is a major factor influencing long-term quality of life in survivors [6]. Mean radiation doses to the superior, middle and inferior constrictors along with the glottis and supraglottic larynx and oesophagus have been shown to correlate with long-term swallow impairment [7]. The use of concurrent chemoradiotherapy is associated with clinically significant rates of severe long-term dysphagia [16,17]. For example, an analysis of three Radiation Therapy Oncology Group (RTOG) studies found that 13% of patients were gastrostomy dependent 2 years after treatment [16]. Several studies have reported a significantly increased duration of enteral feeding with prophylactic gastrostomies compared with a reactive enteral feeding approach [9,10,15,18]. This has led to concern that the use of prophylactic gastrostomy tubes may lead to poorer long-term swallow function [6,11,19]. However, there are few data examining long-term swallow function in relation to the route of enteral nutritional support during treatment.

We have previously reported the enteral feeding outcomes of a retrospective cohort of patients with oropharyngeal cancer treated with concurrent chemoradiotherapy [10]. Within this cohort were 71 patients managed with a prophylactic gastrostomy and 21 patients managed with a nasogastric tube as needed; the median duration of enteral feeding after treatment was 181 versus 64 days, respectively ($P = 0.01$). We suggested that these data 'reinforce concerns regarding the detrimental impact of prophylactic gastrostomy placement upon long-term enteral feed dependence'. The duration of enteral feeding after treatment is affected by many factors. It is unclear whether an increased duration of enteral feeding after treatment is necessarily predictive of poorer long-term swallow function. Here we report on the patients' perspective on long-term swallow function in the same cohort, comparing these two strategies for enteral nutrition.

Materials and Methods

Study Design

The study was registered with the Institutional Quality Improvement Board. In this single institution retrospective study, consecutive patients with locally advanced squamous cell carcinoma of the oropharynx treated with chemoradiotherapy between January 2007 and June 2009 were identified from electronic records. Inclusion criteria were: squamous cell carcinoma of the oropharynx, treatment with curative intent (adjuvant or radical), treatment with concurrent chemoradiotherapy and disease free on follow-up for at least 2 years after treatment. Patients were excluded if treatment was for recurrent disease, required therapeutic enteral feeding before treatment and for disease recurrence at the time of the study. During this period of time, there was no policy at St James' Institute of Oncology on the route and timing of enteral feeding; patients were managed with a prophylactic gastrostomy or a policy of a reactive nasogastric tube based upon clinician and patient preference. Gastrostomies were either inserted endoscopically or radiologically guided, depending upon disease factors and local practice.

The patients included in the study completed treatment more than 2 years earlier and were sent an explanatory letter, together with the MD Anderson Dysphagia Inventory (MDADI) [20]. The MDADI is a validated self-administered questionnaire designed for patients with head and neck cancer [20]. The MDADI consists of 20 questions and is divided into the following subscales: global, emotional, functional and physical. The questions are shown in Table 1. The 1–5-point scoring for each question is described in the legend for Table 1. For each subscale (emotional, functional, physical), the scores are summed and the mean score multiplied by 20 to provide a score with a range of 0–100 (with higher scores representing better functioning). The first question is scored individually in this manner to provide the global subscale. The MDADI questionnaire was sent again to non-responders after an interval of 2 months.

Data including oral intake (categorised as nil by mouth, sips, pureed diet, soft diet and normal diet), weight and the use of enteral feeding were routinely documented by the hospital dietetic team during treatment and during follow-up by the local dietetic teams. Data (oral diet and enteral feeding) were collected by means of a proforma completed by the dietitians, as previously described [10]. Data were requested at 6 weeks, 3, 6 and 12 months after radiotherapy, in addition to the date of discontinuation of enteral feeding.

Treatment Details

Radiation therapy was delivered as previously described [21] using 6 MV photons with a three-dimensional conformal technique. The target volume routinely included bilateral level 1b–V lymph nodes and retropharyngeal lymph nodes at least at the level of the oropharynx. Intensity-modulated radiotherapy was not used during the study period. The standard radical dose was 70 Gy in 35 fractions; adjuvant treatment for high-risk patients was with 66 Gy in 33 fractions. Alternative dose fractionation schedules that were used are shown in Table 2. Induction chemotherapy was used at clinician discretion. Docetaxel, cisplatin and 5-fluorouracil (TPF) and cisplatin and 5-fluorouracil (PF) were used as previously described [21,22]. Standard concurrent chemotherapy was cisplatin 100 mg/m^2 days 1 and 29. Carboplatin AUC 4 was substituted for cisplatin if creatinine clearance was <55 ml/min. During chemoradiotherapy, all patients were reviewed