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## Comparison of outcomes of enteral feeding via nasogastric versus gastrostomy tubes in post operative patients with a principle diagnosis of squamous cell carcinoma of the oral cavity

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### Abstract

**Objectives:** Squamous cell carcinoma of the oral cavity has a profound impact on a patient's nutritional intake, 40-50% of head and neck cancer patients have a markedly impaired nutritional status at the time of their initial presentation. Studies show that patients who have better nutritional status have fewer complications and a better survival rate. Therefore, enteral nutritional support plays an important part in their management. Due to the lack of relevant data, surgeons help patients make informed decisions regarding their mode of nutritional support and perform gastrostomy or place nasogastric tube depending on the patient's preference. This study addresses the need for scientific data regarding the impact and psychosocial acceptance of both these modalities in our population.

**Methods:** A retrospective review of patient's charts with a principle diagnosis of squamous cell carcinoma of the oral cavity, receiving surgery +/- adjuvant radiotherapy was carried out. Patients were also questioned regarding their experience with the mode of nutrition and its impact on their life during their regular follow up consultations. Post therapy change in weight, psychosocial acceptance and quality of life were considered as measures of outcome.

**Results:** A mean weight loss of  $5.43 \pm 3.4$  kg ( $p=0.025$ ) was noticed in 15 patients on nasogastric feeding. On the other hand, significantly less weight loss of  $1.25 \pm 5.12$  kg ( $p=0.025$ ) was noticed in the patients receiving nutrition via gastrostomy tubes; nine patients had a mean weight gain of  $2.89 \pm 1.95$  kg and the rest had similar weight loss of  $5.427 \pm 3.4$  kg.

**Conclusion:** The authors of the study recommend that gastrostomies should be considered for patients requiring long term post operative enteral nutritional support in patients of head and neck cancers.

**Keywords:** Enteral nutritional support, Nasogastric feeding, Gastrostomy, Squamous cell carcinoma, Oral cavity. (JPMA 61:1042; 2011).

### Introduction

Squamous cell carcinoma (SCC) of the oral cavity by virtue of its location has a profound impact on a patient's nutritional intake by impairing either functional chewing, swallowing or leading to a decreased mouth opening (trismus). The primary management of these tumours by surgery, chemotherapy or radiotherapy further stresses the patient's nutritional status and may impair his nutritional intake. Surgical modalities have been associated with severe trismus due to oedema and extensive reconstruction in oropharyngeal cancers. Concurrent chemo/radio therapy advocated for organ preservation in advanced head and neck cancers has also been associated with severe mucositis and dysphagia. Studies report an incidence of 87%, 30 days after treatment.<sup>1</sup> Chronic dysphagia has also been reported in 12-69% of nasopharyngeal cancer patients 6-9 months after their treatment.<sup>2</sup>

The nutritional needs of a cancer patient have

already been well documented. Studies show that nearly 40-50% of head and neck cancer patients have a markedly impaired nutritional status at the time of their initial presentation.<sup>3-5</sup> Fifty five percent have a negative energy balance throughout the course of the disease<sup>6</sup> Severe weight loss has been documented in 58% of patients without enteral nutritional support.<sup>7</sup> The patients' nutritional status has a significant impact on his quality of life, morbidity and mortality.<sup>6,8</sup> Studies show that patients who had better nutritional status had fewer complications<sup>9</sup> and showed improved survival trends when compared with malnourished patients.<sup>10</sup> A prospective cohort showed that in the 38% of patients with impaired nutrition the 2-year survival was only 7.5% when compared to over 57% in the remainder of the cohort.<sup>10</sup> In fact, Mick et al claimed that the strongest independent predictor of survival in multimodality treated stage III/IV head and neck cancer was pretreatment weight loss.<sup>11</sup>

Morbidities associated with poor nutrition during the

course of disease include surgical site infections, wound dehiscence and impaired healing, along with an inability to tolerate anti-neoplastic drugs and immunosuppression. Keeping this in mind, nutritional augmentation was provided to all the cases presenting to our department. Traditionally, nasogastric (NG) feeding was being used to augment the patients' nutritional status; however recently surgeons advocate the use of gastrostomy (G) tubes for this purpose. Due to a lack of relevant guidelines, data on psychosocial acceptance and the limited financial capabilities of patients, our surgeons help patients make informed decisions regarding their mode of nutritional support and perform Gastrostomy or place an NG tube depending on the patient's preference. Our study addresses the need for relevant data regarding the impact and psychosocial acceptance of both modalities in our population.

### Patients and Methods

A retrospective review of patient's progress charts was carried out. Records of all patients with a principle diagnosis of oral cavity squamous cell carcinoma,

receiving surgery ± adjuvant radiotherapy between the years 2006-2008 and receiving enteral nutritional support were reviewed and their details were recorded in a preset questionnaire. Patients were also questioned regarding their experience with the mode of nutrition and its impact on their life during their regular follow up consultations. Post therapy change in weight, psychosocial acceptance and quality of life were considered as measures of outcome.

A total of 32 patient's records were reviewed with 16 receiving nutritional support via NG tubes (Group 1) and 16 via G tubes (Group 2). SPSS v.16 was used for storage and analysis of data. Descriptive frequencies were calculated for age, gender and radiotherapy doses for comparing both groups, while t-test and chi square test were applied to calculate the significance of change in weight and patient acceptance between two groups respectively.

### Results

Our sample consisted of 27 male and 5 female patients; out of which 14 males and 2 females opted for

**Table-1: Summary of participants and outcomes of both feeding modalities.**

	Group 1 (NG)		Group 2 (Gastrostomy)	
	Number	Percentage	Number	Percentage
<b>Disease Stage</b>				
Stage I	0	0	0	0
Stage II	5	31.25	3	18.75
Stage III	1	6.25	2	12.5
Stage IV	10	62.5	11	68.75
<b>Surgery</b>				
Flap Reconstruction	7	43.75	7	43.75
Neck Dissection	16	100	16	100
Mandibulectomy	5	31.25	8	50
<b>Radiation</b>				
>6000 cGy	3	18.75	1	6.25
=6000 cGy	5	31.25	8	50
Data NA	8	50	7	43.75
<b>Complications of Radiation</b>				
Mucositis	16	100	16	100
Dysphagia	16	100	16	100
Loss of taste	16	100	13	81.25
Xerostomia	14	87.5	10	62.5
Odynophagia	16	100	8	50
<b>Complications of feeding</b>				
Tube Dislodgement	2	12.5	0	0
Stomal Leak	0	0	1	6.25
Wound Infection	0	0	2	12.5
Gastroesophageal Reflux	9	56.25	0	0
Aspiration Pneumonia	2	12.5	0	0
<b>Patient Acceptance and Rating</b>				
Excellent	1	6.25	2	12.5
Good	0	0	5	31.25
Fair	5	31.25	5	31.25
Poor	10	62.5	4	25
Recommendation for other patients	0	0	16	100

gastrostomy over NG feeding. Both groups receiving NG or G tube feeding were comparable in all other aspects with mean ages  $49 \pm 7.94$  and  $47 \pm 10.99$  years respectively and a similarly distributed staging of the disease. The extent of surgery and radiation therapy was also similar as 7 flap reconstructions, 16 neck dissections and 5 mandibulectomies were performed in group 1 compared to 7 flap reconstructions, 16 neck dissections and 8 mandibulectomies in group 2, augmented by  $>6000$  cGy of radiation in 3 patients and  $=6000$  cGy in 5 patients of group 1 compared to  $>6000$  cGy of radiation in 1 patient and  $=6000$  cGy in 8 patients of group 2 (Table).

No significant differences were present in the side effects of radiotherapy. However, fewer patients had associated loss of taste, xerostomia and odynophagia in group 2 as compared to group 1. The incidence of mucositis and dysphagia was similar between both groups (Table).

Out of 16 patients in group 1, a mean weight loss of  $5.43 \pm 3.4$  kg from the point of diagnosis to their last follow up consultation was noticed in 15 patients and 1 was noticed to gain 1.5 kg weight. In group 2 the mean weight loss was significantly lower at  $1.25 \pm 5.12$  kg ( $p=0.025$ ), nine patients had a mean weight gain of  $2.89 \pm 1.95$  kg and the rest had similar weight loss of  $5.427 \pm 3.4$  kg. However, it is of interest to note that patients in group 1 were able to receive enteral nutritional support for a mean period of 15 days compared to 6 months in group 2.

Fewer complications were noted in group 2 as only 1 patient developed a stomal leak and 2 patients had surgical site infections, when compared to group 1 where 2 patients had dislodged NG tubes, 2 contracted aspiration pneumonia and 9 developed clinically significant Gastroesophageal reflux disease (GERD) (Table).

Patient acceptance was also better in group 2 with a 100% recommending G tubes for other patients and 7 patients describing their experience as good or excellent compared to 1 patient in group 1 and no recommendations for NG tubes (Table).

## Discussion

The nutritional needs of head and neck cancer patients have been well documented. Major indicators of long-term postoperative nutritional support include stage IV cancers, primary pharyngeal tumours, tumors treated with concomitant surgery and radiotherapy, and preoperative weight loss of more than 10 pounds (4.535 kg).<sup>12</sup> Studies have shown that patients undergoing radiotherapy for head and neck cancer have eating disabilities and the disability increases with duration and

dosage of therapy.<sup>13,14</sup> The findings of our study concur with this pattern.

A recent study showed that early enteral nutrition improves treatment tolerance and outcomes in head and neck cancer patients undergoing concurrent chemo radiotherapy, resulting in fewer complications and hospital admissions.<sup>15</sup> The study found that patients receiving NG tube feeding lost comparatively less weight during chemo radiotherapy than controls and had fewer treatment breaks indicating the importance of nutritional support in head and neck cancer.<sup>16</sup> However NG tube feeding is a temporary means of enteral supplementation requiring constant replacement. It is poorly tolerated due to the constant need for replacement, aesthetic outlook along with the associated issues of gastro-oesophageal reflux, aspiration, nasal ulceration and frequent blockage of the tube. Prolonged use has also been associated with pressure necrosis of the nasal ala as well as the mucosa of the upper aerodigestive tract.

Gastrostomy tubes are now found to be preferable due to their greater mobility, better cosmetic appearance and improved subjective quality of life.<sup>17,18</sup> They also sustain higher flow rates as compared to NG tubes accommodating bolus feeds. Due to these advantages over traditionally used NG tubes, it has become the modality of choice for patients requiring long term enteral nutritional support.

Our patients responded well to gastrostomy tubes with 100% recommending them to other patients requiring nutritional support. Also, the duration of enteral feeding with gastrostomy tubes was significantly higher than those receiving NG feeding. Patients could tolerate an NG tube for a mean duration of 15 days as compared to 6 months on gastrostomy. Thus the patients requiring long term nutritional support should be considered for feeding gastrostomies. The longer duration of enteral nutritional support as demonstrated in our study will have a greater impact on the patient's nutritional status, improved quality of life and overall survival rate.

Variable complication rates have been reported for gastrostomies throughout literature ranging from 6% to 17.5% for minor complications and 2.7% to 22.5% for major complications.<sup>19</sup> Minor complications include peristomal wound infection, tube obstruction and leakage whereas major complications include peritonitis, premature removal and intestinal perforation.<sup>20</sup> Studies have shown that gastrostomy tube usage may be associated with long-term swallowing disability in a small percentage of patients, especially in older individuals.<sup>21,22</sup> However pretreatment swallowing exercises may further decrease its incidence, as it has been shown to produce

measurable improvement in post treatment swallowing function in patients undergoing organ-preservation chemo radiotherapy for head and neck cancers.<sup>23</sup>

When comparing the two modalities, we would recommend the use of gastrostomy tubes for long term post operative enteral nutritional support over NG tubes due to increased patient compliance and acceptance as well as longer duration of feeding and better functional outcomes.

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