



Oncology LunchBox:
Tools for the Nutritional
Management of Upper GI
Cancers

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Upper GI Cancer Educational Program
May 2014



No Conflicts to Disclose

Mitigating Potential Bias
Not Applicable

Objectives

- 1) Identify the most common nutritional challenges experienced by patients with esophageal and pancreatic cancer.
- 2) Provide basic nutritional advice (and resources) to patients in order to minimize malnutrition risk and improve treatment tolerance.
- 3) Identify symptoms of pancreatic insufficiency and the use/benefits of supplementation with pancreatic enzymes.

Esophageal Cancer

- Squamous cell carcinomas → arise from upper 2/3 of the esophagus; smoking & alcohol are primary risk factors.
- Adenocarcinomas → arise from columnar epithelial cells found in the lower 1/3 of the esophagus; GERD, Barrett's esophagus and obesity are primary risk factors.
- Symptoms rarely occur when the disease is localized.

Esophageal Cancer

- Presenting symptoms often include;
 - ✓ weight loss*
 - ✓ dysphagia* ← **70% of patients*
 - ✓ heartburn
 - ✓ coughing
 - ✓ hoarseness
- 50% of patients have non-resectable disease due to comorbidities or advanced disease at diagnosis.

Case Study: Esophageal Cancer

Presentation

- 45 yo male with adenoca of distal esophagus (? Stage III)
- 6-month hx of dysphagia, no weight loss, hx of GERD
- married, 2 kids, paramedic
- upper GI endoscopy – 75-90% of lumen occupied by tumor; 7 cm in length
- surgery recommended but pt went to Mayo for 2nd opinion
- Mayo – recommended neoadjuvant chemoradiation



Case Study: Esophageal Cancer

Treatment

- neoadjuvant CRT in MB (45 Gy x 25 fractions with concomitant cisplatin/infusional 5FU)
- Mayo for surgery – Ivor-Lewis esophagogastrectomy with jejunostomy feeding tube
- tumor down staged to IIB
- started adjuvant ECF chemo at CCMB (1 out of 4 cycles administered)
- jejunostomy feeding tube removed after first cycle
- initial referral to CCMB dietitian



Case Study: Esophageal Cancer

Initial Nutritional Assessment

- anthropometrics: ht=182 cm
- weight hx;
 - diagnosis = 143 kg (BMI = 43)
 - pre-op = 141 kg
 - post-op = 135 kg
 - current = 125 kg (BMI = 38)
- worsening **dysphagia** with daily **emesis**
- diet hx -- liquids only; 2 litres/day but mostly water, iced tea & juice
- no nutritional supplements – worsen **dumping** syndrome symptoms



Case Study: Esophageal Cancer

Questions

- 1) How much weight has the patient lost? Calculate the percentage of wt loss. Is this concerning?
- 2) Is he meeting his fluid and nutritional needs?
- 3) What steps should be taken to manage his emesis and dysphagia?
- 4) What should he be eating and/or avoiding to reduce symptoms of dumping syndrome?

Case Study: Esophageal Cancer

Questions

1) How much weight has the patient lost?
Calculate the percentage of weight loss.
Is this concerning?

$$143 \text{ kg} - 125 \text{ kg} = 18 \text{ kg}$$

$$\frac{18 \text{ kg}}{143 \text{ kg}}$$

$$\times 100 = 12.6\% \text{ (x 5 months)}$$

severe weight reduction

Classification of Weight Loss

<u>Time</u>	<u>Significant Wt Loss (%)</u>	<u>Severe Wt Loss (%)</u>
1 week	1-2	> 2
1 month	5	> 5
3 months	7.5	> 7.5
6 months	10	> 10

$$\% \text{ Wt Loss} = \frac{\text{wt change (previous wt-current wt)}}{\text{previous wt}} \times 100$$

Blackburn, JPEN, 1977

Case Study: Esophageal Cancer

Questions

2) Is he meeting his fluid and nutritional needs?

No.

See Table 1: “Nutritional Needs for Esophageal Cancer”

Case Study: Esophageal Cancer

Questions

2) Is he meeting his fluid and nutritional needs? No.

Nutrient	Estimated Nutrient Needs
Energy	30-35 kcal/kg
Protein (based on normal renal function)	1.0-1.2 grams/kg, non-stressed, no weight loss 1.2-1.6 grams/kg, stressed, weight or muscle loss
Vitamins	100% of DRI or adjusted per specific needs (patient may need to avoid antioxidant supplements during treatment)
Minerals	100% of DRI or adjusted per specific needs (e.g. some chemotherapy agents increase renal loss of Mg, thus increasing needs)
Fluid	Body Surface Area Method: 1500 mL/m ² Needs will vary depending on individual assessment (e.g. increased needs due to diarrhea)

Case Study: Esophageal Cancer

Questions

3) What steps should be taken to manage his emesis and dysphagia?

Given a prescription for Nexium.

Presented to ER where an upper endoscopy was performed – no stricture or narrowing.

Texture modified diet (liquids → soft).

Case Study: Esophageal Cancer

Questions

4) What should he be eating and/or avoiding to reduce symptoms of dumping syndrome?

Dumping Syndrome

- Esophagogastrectomy involves removal of the tumor in the esophagus, nearby lymph nodes and proximal stomach.
- Remaining stomach is pulled up & connected to the remaining esophagus.
- The altered anatomy of this procedure can increase reflux episodes and speed up gastric emptying.

Dumping Syndrome

- When incompletely digested, hyperosmolar chyme from the stomach enters the SI, extra fluids enter the SI leading to bloating, abdominal cramps, nausea and “dumping”.
- See Table 2: “Anti-Dumping Diet”.

Anti-Dumping Diet

	Timing	Symptoms	Medical Nutrition Therapy
Early Dumping (75% of cases)	10-30 minutes after eating	<u>Epigastric</u> fullness, nausea, vomiting, abdominal cramps, bloating, diarrhea, lightheadedness, diaphoresis, desire to lie down, <u>borborygmi</u> , pallor, palpitations	An anti-dumping diet should limit food high in simple sugars. Foods high in soluble <u>fibres</u> may reduce symptoms. Lactose-free foods may be better tolerated. Small amounts (<u><1 Tbsp/meal</u>) of oil, butter or margarine can be added for energy but fried/greasy foods should be avoided. Drink liquids 30 minutes before or after meals, but not during meals. Eat 5-6 small meals daily and avoid eating large portions. Eating slowly and chewing food into very small pieces may also be helpful.
Late Dumping (25% of cases)	1-3 hours after eating	Hunger, perspiration, tremors, difficulty concentrating	

Case Study: Esophageal Cancer

Follow Up

- dumping syndrome symptoms improved with nutritional guidance (i.e. less simple sugars, less fluids during mealtimes, etc.)
- dysphagia slowly improved & he was able to reintroduce soft foods
- completed all 4 cycles of adjuvant chemo
- disease recurrence 15 months later – further tx with FOLFOX and FOLFIRI
- eventually died approximately 2.5 years following initial diagnosis





Non-Resectable
Esophageal
Cancer

Esophageal Stents

- Up to 95% of patients will have immediate relief of symptoms (dysphagia).
- Pain for 24 to 48 hours post-insertion.
- Fully or partially covered, self-expanding metal stents.
- Stent size:
 - ✓ Average diameter (main body) = 18 mm.
 - ✓ Length = 40 to 120 mm.



*Ultraflex™ Esophageal Stent by
Boston Scientific*

Esophageal Stents

- Lack of evidence for standardized diet guidelines post-stent insertion.
- No RCTs, only “consensus” or expert opinion.
- Stent manufacturers also lack guidelines for patients.
- 2013 → developed guidelines for patients (Dr. Dana Moffat, SBGH surgical RD and CCMB dietitians).

Esophageal Stents

Nutrition Guidelines

- Liquids only for first 48 to 72 hours (to allow for stent to fully expand).
- Advance to pureed foods for 1-2 days.
- If tolerated, progress to minced, moist foods.
- Eat slowly & chew foods thoroughly.
- 5-6 small meals/snacks per day.
- Consume fluids before, during & after meals to assist in flushing foods through stent (hard swallows).
- Remain upright for 60 minutes after eating.

Pancreatic Cancer

- Exocrine tumors → 95% of pancreatic tumors with 90% being adenocarcinomas.
- Endocrine tumors → rare and make up 3-4% of all pancreatic cancers.
- Symptoms rarely present in the early stage of the disease.
- Due to anatomical location of the cancer and its potential effect on exocrine, endocrine and biliary function, pts with pancreatic cancer are at especially high risk of nutrition problems.

Pancreatic Cancer

- Presenting symptoms often include;
 - ✓ weight loss* ← **89% of patients*
 - ✓ malabsorption
 - ✓ jaundice
 - ✓ abdominal pain
 - ✓ poor appetite
 - ✓ delayed gastric emptying/gastric outlet obstruction
 - ✓ diabetes
 - ✓ ascites

Case Study: Pancreatic Cancer

Presentation

- 47 year old male with locally metastatic pancreatic cancer (adenocarcinoma – mixed pattern), T3N1
- 6-month hx of epigastric pain, diarrhea with cramps and abdominal gas, nausea, jaundice, wt loss, dysgeusia
- married, 2 kids, physically active
- former cigarette smoker and previous alcohol, smokes marijuana regularly



Case Study: Pancreatic Cancer

Treatment

- biliary stent inserted
- Whipple procedure (close margins)
- recommended adjuvant Gemcitabine
- initial referral to CCMB dietitian shortly after commencing chemo



Case Study: Pancreatic Cancer

Initial Nutritional Assessment

- anthropometrics: ht=192 cm
- weight hx;
UBW = 103.7 kg (BMI =28)
post-op wt = 71.7 kg
current = 80.7 kg (BMI =21.9)
- improvement of **diarrhea** (1-2x/day), **abdominal cramps, gas** and **dysgeusia** since surgery
- using pancreatic enzymes (Creon) as prescribed by surgeon
- diet hx -3 regular meals/day plus snacks
- fluids include water, 7-up, iced tea and chocolate milk
- using nutritional supplements - c/o taste fatigue



Case Study: Pancreatic Cancer

Questions

- 1) What are the causes of weight loss in the patient?
- 2) Are pancreatic enzymes indicated?
- 3) What could be exacerbating diarrhea in the patient and how should it be managed?

Case Study: Pancreatic Cancer

Questions

1) What are the causes of wt loss in the pt?

Malabsorption, hypermetabolism, decreased oral intake secondary to anorexia, nausea, dysgeusia, abdominal cramping/pain and diarrhea.

Case Study: Pancreatic Cancer

Questions

2) Are pancreatic enzymes indicated?

Yes.

Pancreatic Exocrine Insufficiency Signs and Symptoms

- abdominal bloating
- cramping after meals
- indigestion
- excessive gas (burping or flatulence)
- fatty, light colored stools
- frequent stools*
- loose stools*
- unexplained weight loss

**may not be present d/t narcotic pain meds*

Pancreatic Exocrine Insufficiency

- May be observed in pts upon diagnosis, during non surgical treatment and/or following surgery due to the inability of the pancreas to make or secrete enzymes.
- 25-50% of pts experience PEI as a long-term side effect of Whipple surgery.
- Studies indicate 80-90% of pts with pancreatic cancer may have PEI and malabsorption.

(Keller et al, GUT, 2005), (Imrie et al, Aliment Pharmacol Ther, 2010)

Pancreatic Exocrine Insufficiency

- Pancreatic enzyme replacement therapy (PERT) is the treatment for PEI.
- Pancreatic enzymes contain the active ingredient pancrelipase – mixture of digestive enzymes amylase, lipase and protease.
- Different brands of pancreatic enzyme supplements (e.g. Creon, Pancrease, Cotazym, Ultrase, Viokase).
- Treatment is safe and has few side effects. (Fieker, Clin & Exp Gastroent, 2011)

Case Study: Pancreatic Cancer

Questions

3) What could be exacerbating diarrhea in the patient and how should it be managed?

Treatment-related side effect, dumping syndrome, lactose intolerance, timing and dosing of pancreatic enzymes.

Management of Diarrhea

- As indicated, encourage a low fat, low fiber and/or low lactose diet, avoiding gas producing foods, caffeine, and alcohol.
- Consider using bulking agents (psyllium), pectin or soluble fibre foods.
- Anti-dumping diet.
- 6-8 small meals/day.
- Pharmacologic interventions.

Dosing of Pancreatic Enzymes

- Dose measured in lipase units.
- Type and dose of pancreatic enzymes must be individualized.
- Usual starting dose for meals is 20,000-40,000 lipase units and half amount for snacks.
- Enzyme doses should start small and titrated up until symptoms resolve.

Tips to Obtain Best Results from Pancreatic Enzymes

- Take with every meal and snack that contains fat. Adjust dose accordingly.
- Do not crush or chew.
- Enzyme dose should be divided and administered throughout the meal.
Timing is as important as dosing.
- Add H₂-receptor antagonist or proton-pump inhibitor.

Case Study: Pancreatic Cancer

Follow Up

- wt stabilized following a further 10 kg wt gain by following a high protein/high energy diet
- symptoms of PEI are controlled with pancreatic enzymes (Cotazym)
- completed 8 cycles of Gemcitabine prior to diagnosis of metastatic disease (lung, ?liver and multiple nodules)
- commenced FOLFIRINOX chemo (Oxaliplatin was discontinued d/t neuropathy)
- despite possible progression, pt feeling well and tolerating treatment



Nutrition Resource for Pancreatic Cancer

- Diet & Nutrition – Nutritional Concerns with Pancreatic Cancer Booklet
- Pancreatic Cancer Action Network
- www.pancan.org

Gastric Cancer

- Malnutrition and weight loss occurs in >70% of people diagnosed with gastric ca partially explained by decreased food intake secondary to early satiety, heartburn/indigestion, abdominal pain/discomfort, nausea/vomiting and anorexia.
- Modality of treatment has unique side effects and increased when they are combined.

Gastric Cancer – Nutrition Related Considerations

- Surgery (partial or total gastrectomy)
 - ✓ feeding tubes
 - ✓ GERD
 - ✓ dumping syndrome
 - ✓ osteoporosis risk
 - ✓ vitamin & mineral malabsorption
(iron, folate and vitamin B12)

Gastric Cancer – Nutrition Related Considerations

- Chemotherapy/RT
 - ✓ anorexia
 - ✓ nausea/vomiting
 - ✓ diarrhea
 - ✓ mucositis

Key Messages

- Weight loss and malnutrition are prominent features in esophageal, gastric and pancreatic cancers, with pancreatic cancer having the greatest nutritional implications of all upper GI cancers.
- Dumping syndrome is a nutrition impact symptom of surgeries in upper GI cancers, which can be managed with medical nutritional therapy (anti-dumping diet).
- Dysphagia is the most common presenting nutrition impact symptom in esophageal ca, which may require the placement of a stent in non surgical pts.

Key Messages

- Pancreatic enzyme replacement therapy is the standard treatment for pancreatic exocrine insufficiency to provide relief of symptoms, maintain body weight, restore nutritional status and improve QOL.
- Pts require individualized education with respect to pancreatic enzyme dosing, compliance and timing of administration, to ensure efficacy.
- More research/data on the clinical practice of enzyme replacement therapy in both surgical and non-surgical treated pts with pancreatic cancer is required.
- A multidisciplinary approach is crucial to the management of upper GI cancer to increase QOL, improve treatment outcomes and prognosis.