
Title: Case 8 – Ulcer Disease: Medical and Surgical Treatment

**Instructions:** Answer the questions below. Please print the questions out with your answers and bring to class on the due date.

**Questions:**

1. Identify the patient’s risk factors for ulcer disease.
   
   The patient tested positive for H. Pylori, which can affect mucosal integrity. The patient also uses tobacco and drinks many caffeinated beverages per day. Patient has family history of PUD. Other risk factors include low hematocrit and hemoglobin levels, which may indicate a possible blood loss as well as inadequate nutritional intake.

2. How is smoking related to ulcer disease?
   
   Smoking has been shown to increase the production of pepsin, among other substances, that have been shown to have damaging effects to the intestinal lining. Smoking also inhibits protective factors for the lining including decreasing blood flow and the secretion of mucous and other protective substances, as well as decreasing the amount of sodium bicarbonate that is produced (a protective factor because it neutralizes).

3. What role does *H. pylori* play in ulcer disease?
   
   *H. pylori* are spiral-shaped bacteria that damage the mucous coating that protect the lining of the stomach and duodenum. Once *H. pylori* has damaged the mucous coating stomach acid can get through the sensitive lining, irritating the stomach or duodenum and leading to a peptic ulcer.

4. Four different medications were prescribed for treatment of this patient’s *H. pylori* infection. Identify the drug functions/mechanisms. (Use table below.)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metronidazole</td>
<td>Antibiotic used to treat H. Pylori, decreases acid secretion</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>Antibiotic, Inhibits bacterial protein synthesis</td>
</tr>
<tr>
<td>Bismuth subsalicylate</td>
<td>Antidiarrheal/Antacid, treats stomach and GI discomfort</td>
</tr>
<tr>
<td>Omeprazole</td>
<td>Proton pump inhibitor, blocks production of acid secretions</td>
</tr>
</tbody>
</table>

5. What are the possible drug–nutrient side effects from Mrs. Rodriguez’s prescribed regimen? (See table above.) Which drug–nutrient side effects are most pertinent to her current nutritional status?
   
   Most of these should not be taken with food as it decreases the bioavailability of the drug. Metronidazole can cause anorexia and decreases sodium may be advised. Tetracycline can decrease drug and mineral absorption, and it’s absorption is altered by calcium. Bismuth subsalicylate binds to protein, its effects may be augmented due to the patients low protein intake. Omeprazole can decrease absorption of calcium, iron and B12. As with all medications, alcohol should be avoided.

6. Explain the surgical procedure the patient received.
   
   The patient received a gastrojejunostomy, a procedure during which an anastomosis is created between the proximal end of the jejunum and the stomach. Normally this procedure is done to drain the contents of the stomach or to provide a bypass for gastric contents. A percutaneous approach can be performed during which a tube is placed through the abdominal wall into the stomach and then through the duodenum into the jejunum.

7. How may the normal digestive process change with this procedure?
   
   The reduced capacity of the stomach and changes in gastric emptying and transit time alter the digestive process dramatically. The patient will not be able to digest lipids and carbs in the duodenum as there is a lack of absorption of macronutrients. Simple carbohydrates may cause dumping syndrome to occur. The patient is at significant nutritional risk due to decreased oral intake, maldigestion and malabsorption.
8. The most common physical side effects from this surgery are development of early or late dumping syndrome. Describe each of these syndromes, including symptoms the patient might experience, etiology of the symptoms, and standard interventions for preventing/treating the symptoms.

Dumping syndrome occurs when undigested contents in the stomach pass too quickly to the small intestine. In early dumping syndrome symptoms generally occur within 15-30 minutes of a meal and include GI distress (N/V, cramps, diarrhea, fullness) as well as cardiovascular effects (flushing, dizziness, rapid heart rate). In late dumping syndrome symptoms will occur within 1-3 hours of a meal and can include sweating, hunger, fatigue, dizziness, confusion and rapid heart rate. Late dumping syndrome occurs when a large amount of sugars are dumped into the small intestine, causing hyperglycemia, for which the body releases insulin in large amounts leading to low levels of sugar in the body (hypoglycemia). Treatment for both early and late dumping syndrome include dietary modifications to avoid trier foods and to consume smaller meals. Liquids should not be consumed within 30 minutes of a meal. There are also some medications that may help to treat some of the symptoms.

9. What other potential nutritional deficiencies may occur after this surgical procedure? Why might Mrs. Rodriguez be at risk for iron-deficiency anemia, pernicious anemia, and/or megaloblastic anemia?

Consequences of the patient’s surgical procedure include malnutrition, food intolerances, electrolyte imbalances, iron deficiency and decreases in calcium and vitamin B12. The patient could be at risk for anemia if her ulcer leads to bleeding, in which case nutrients such as iron, which are found in the blood, would be lost. If she is unable to absorb B12 then there will be less RBC, which reduces the amount of iron in the bloodstream.

10. Should Mrs. Rodriguez be on any type of vitamin/mineral supplementation at home when she is discharged? Would you make any recommendations for specific types? Explain.

A multivitamin would likely be beneficial for the patient to ensure that adequate levels of vitamins and minerals are being obtained. If the patient develops anemia, an iron supplement should be administered. The patient could benefit from prophylactic supplementation, which are injectable so they don’t need to be absorbed by the stomach or intestine.

11. Prior to being diagnosed with GERD, Mrs. Rodriguez weighed 145 lbs. Calculate %UBW and BMI. Which of these is the most pertinent in identifying the patient’s nutrition risk? Why?

%UBW: 75.8%  
BMI: 19.53 kg/m²

The percent UBW is the most important information since the BMI still falls within the normal weight range. The %UBW is significantly lower and demonstrates that she has had severe weight loss, a good indication that she is at nutritional risk due to her unintended weight loss due to her difficulties associated with eating.

12. What other anthropometric measures could be used to further confirm her nutritional status?

The RD could do a ski-fold test to look at body composition.

13. Calculate energy and protein requirements for Mrs. Rodriguez.

Mifflin: 1263 x 1.2 = 1516 kcal  
Empirical: 1250-1500 kcal (25-30 kcal/kg)  
Protein: 60-75g (1.2-1.5 g/kg)

14. This patient was started on an enteral feeding postoperatively. What type of enteral formula is Peptamen AF? Using the current guidelines for initiation of nutrition support, state whether you agree with this choice and provide a rationale for your response.

Peptamen is a high calorie formula specifically designed for those with malabsorptive disorders. This formula appears to be appropriate for the patient due to her critical medical condition which is altering her GI tract. This formula has added antioxidants and fiber as well as high protein, which is congruent with the patient's needs.

15. Why was the enteral formula started at 25 mL/hr?

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The feeding started at 25 mL/hr due to the patient’s previous diet of ice chips, it will take time for the body to adjust to constant feeding. This also allows for the RD and nurse to monitor the patient’s tolerance to the feeding.

16. Is the current enteral prescription meeting this patient’s nutritional needs? Compare her energy and protein requirements to what is provided by the formula. If her needs are not being met, what should be the goal for her enteral support?

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1.5 \text{ kcal/mL} \times 25 \text{ mL/hr} = 37.5 \text{ kcal/hr} \times 24 \text{ hrs} = 900 \text{ kcal/day}
\]

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40.56 \text{ g protein/day}
\]

The patient’s needs are not being met, the feeding should be increased to 45 mL/hr, which would provide the patient with 1620 kcal/day (slightly higher than her estimated needs of 1600 however considering her recent weight loss this seems appropriate) and 73 g of protein.

17. What would the RD assess to monitor tolerance to the enteral feeding?

The RD should monitor the tolerance of the feeding by checking residuals and N/V as well as the check the amount of feeding administered vs. the amounts ordered. Additionally, the patient’s stools, chemical profiles and daily weight should be monitored.

18. Using the intake/output record for postoperative day 3, how much enteral nutrition did the patient receive? How does this compare to what was prescribed?

The patient received about .45 L of formula when she should have been receiving 1.08 L to meet nutritional needs.

19. As the patient is advanced to solid food, what modifications in diet would the RD address? Why? What would be a typical first meal for this patient?

The patient should start with blended meals that are low in both fat and carbohydrates and high in protein. Meals should be small and nutrient dense. Fluids should be consumed at least 30 minutes prior/after meals, but not with food. The patient should avoid foods with tough fibers, soft foods will be recommended for the first couple of weeks to ensure that patient is able to digest them.

20. What other advice would you give to Mrs. Rodriguez to maximize her tolerance of solid food?

Take small bites, chew food thoroughly, eat frequent meals and avoid liquid and food at the same time. Avoid spicy foods, high fat foods and acidic foods.

21. Mrs. Rodriguez asks to speak with you because she is concerned about having to follow a special diet forever. What might you tell her?

I would urge the patient to not consider this a diet as it will be important for her to follow these guidelines for life. However, it will become habitual and she will adjust, slight modifications to her previous diet will make huge strides in her comfort level in her current situation. I would be positive and encouraging as by in large she will be making positive and healthy lifestyle changes that should greatly improve her quality of life.

22. Using her admission chemistry and hematology values, which biochemical measures are abnormal? Explain.

a. Which values can be used to further assess her nutritional status? Explain.

The patient had elevated BUN (liver is under stress), an elevated BUN/Crea ratio, high bilirubin (liver problems, damaged RBC), low protein (malnutrition), low albumin and prealbumin (malnutrition), high WBC (surgery), low hemoglobin and hematocrit (anemia, malnutrition) and low lymphocytes (surgery).

b. Which laboratory measures (see lab results, pages 84–85) are related to her diagnosis of a duodenal ulcer? Why would they be abnormal?

WBC has increased in response to her recent surgery. Segs are elevated due to inflammation. Bilirubin is not being excreted causing elevated levels in the body. It possible that she is losing albumin and prealbumin if her ulcer is bleeding. All of her abnormal values can be related to her surgery and drug-nutrient interactions.
23. Do you think this patient is malnourished? If so, what criteria can be used to support a diagnosis of malnutrition? Using the guidelines proposed by ASPEN and AND, what type of malnutrition can be suggested as the diagnosis for this patient?

The patient does appear to be malnourished as she is experiencing insufficient energy intake, weight loss and has quite possibly lost muscle mass as well as subcutaneous fat. The patient has experienced a 24% weight loss since her diagnosis of GERD 11 months ago, therefore I would suggest the patient is experiencing severe malnutrition.

24. Select two nutrition problems and complete the PES statement for each.

Inadequate energy intake related to duodenal ulcer as evidenced by severe weight loss of 24% of UBW in the past 11 months.

Insufficient nutrient absorption related to recent gastrojejunostomy surgery as evidenced by low magnesium (1.7 mg/dL), low calcium (8.7 mg/dL) and low hemoglobin (10.2 g/dL).

25. For each of the PES statements that you have written, establish an ideal goal (based on the signs and symptoms) and an appropriate intervention (based on the etiology).

Goal: Maintain current body weight at IBW

Intervention: Increase enteral feeding to 45 mL/hr to provide 1620 kcal and 73 g protein.

Goal: Increase blood serum levels of magnesium (1.8-3 mg/dL), calcium (9-11 mg/dL) and hemoglobin (12-15 g/dL)

Intervention: Provide supplements for calcium, magnesium and iron through prophylactic injections.

26. What nutrition education should this patient receive prior to discharge?

The patient will need to be advised on foods that should be avoided in her diet to lessen her symptoms. Beverages such as coffee and soda can irritate her GI tract and while they aren’t necessarily off-limits that should be consumed on a very limited basis. She should be informed about malnutrition as well and the importance for her to receive adequate energy intake. The RD and the patient should compile a list of foods that the patient enjoys and that are safe for her to eat as well as create a few meal plans in order to help the patient understand her energy and nutrient needs that are necessary to maintain her weight and her nutritional status.

27. Do any lifestyle issues need to be addressed with this patient? Explain.

The patient needs to discontinue her tobacco use. Tobacco is altering the integrity of the mucosa. Referring her to a cessation specialist may be beneficial for her to start the process of quitting. The patient should also consider physical activity as it would be beneficial for her overall health and well-being, walks in the evening with her daughters may be a good place to start.