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Case Report
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A case of nutritional management and challenges after esophageal cancer surgery*

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ABSTRACT

Malnutrition and cachexia are common in cancer patients. Malnutrition rates of cancer patients vary according to the location of the tumor. In esophageal cancer, severe cachexia and sarcopenia are seen at the time of diagnosis. The defense of nutritional therapy (NT) against cancer, especially gastrointestinal cancer, is very difficult. NT should start with the diagnosis of the disease. The aim of NT should be to prevent cancer cachexia, related complications, and mortality. In Türkiye, squamous cell esophageal cancer is often seen, especially due to dietary habits (hot drinks, meat-based diet low in vegetables). This is a case report of a 55-year-old male patient who had lots of challenges during the nutritional management after esophageal cancer surgery. The patient's complaints did not improve after neoadjuvant therapies and minimally invasive esophagectomy (MIE) was performed. Inflammation and fistula were seen after major abdominal surgery. As long as the fistula and drainage were continued, parenteral nutrition (PN) remained the only option for NT allowing the bowel to rest in the presence of a fistula. In case of contraindication to oral or enteral nutrition (EN), PN was started on day 6 of MIE. Since it was thought that oral or EN could not be started for more than 10 days, a central catheter was placed, and the patient was fed with CPN (central parenteral nutrition). After the insertion of a stent and a nasojejunal (NJ) tube, EN combined with CPN could be applied. Because of anastomotic leakage, oral nutrition couldn't be continued. Short-term peripheral parenteral nutrition (PPN) therapy was continued until the leakage stopped. The patient was discharged with oral and oral nutritional supplements. Two years after the MIE, no significant difference from previous radiological reports was found and there were no problems with oral nutrition.

Keywords: Enteral, esophagus cancer, nutrition, parenteral

INTRODUCTION

Esophageal cancer is one of the most common cancers worldwide. There are two types of esophageal cancer, squamous cell carcinoma and adenocarcinoma.[1,2] Dysphagia and weight loss are typical symptoms of malnutrition.[3,4] Nutritional screening and assessment are the most important part of esophageal cancer therapy.[5] Nutritional screening should performed in all patients and specific tools are needed. Nutritional screening should be done immediately and repeated at intervals according to the guidelines established by the European Society for Clinical Nutrition and Metabolism (ESPEN), the Academy of Nutrition and Dietetics, the American Association for Parenteral and Enteral Nutrition, and the American Society for Parenteral and Enteral Nutrition (ASPEN).[5-7] ESPEN frequently recommends the use of NRS-2002 in cancer patients.[8]

In the postoperative phase of total esophagectomy, oral or EN therapy should be preferred over PN therapy, if there is no contraindication. In case of postsurgical complications, such as anastomotic leakage, etc., may cause some difficulties in nutritional treatment.

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Nutritional interventions, such as EN combined PN therapy, should be applied instantly to improve patient outcomes and limit further complications. A high number of complications arise from surgery, many of which affects nutrition. Malnutrition and cachexia are exacerbated as a result of this intensive surgery. The impact of malnutrition is multifactorial, and regardless of the patient's body-mass index unintentional weight loss of more than 10% in the preceding six months poses a significant risk of morbidity and mortality in cancer patients. Despite the difficulties, the aim is to correctly assess nutritional status and provide appropriate NT. NT is better performed with the cooperation of a multidisciplinary nutrition team. Although EN after esophagectomy is accepted as a standard of NT, the timing and method of delivering EN remain questionable. This report aims to show the timing and type of EN solution after esophagectomy.

CASE REPORT

The patient, who had complaints (chest pain and difficulty swallowing solid foods) in 2017, had a weight loss of 15 kg in the last six months. After the diagnosis of esophageal squamous cell cancer, he received chemotherapy and radiotherapy in an external hospital. With a weight of 64 kg and height of 1.70 m, the fifty-year-old male was admitted to our general surgery outpatient clinic complaining of esophageal cancer for a minimally invasive esophagectomy (MIE) operation in 2018 (Table 1). He had no history of smoking, alcohol, or co-morbidities. There is no information about the patient's preoperative nutritional status and NT.

We work as consultants in the clinical nutrition unit (CNU). The patient was referred to the CNU 6 days after MIE. He had a cough and sputum. His fever was 38.7°C and CRP (C-Reactive Protein) was 394 mg/L. The fistula was detected on a postoperative thorax-CT scan. Drainage was provided with an inserted tube thoracostomy. After the nutritional assessment, we observed that the patient, who had a weight loss of > 5% and reduced food intake, was cachectic. The nutritional status was evaluated with NRS-2002. The nutritional score was 4 and NT was planned. His daily energy and protein requirements were 1600-1920 kcal (25-30 kcal/kg/day) and 77-128 gr (1.2-2 g/kg/day), respectively. PPN (peripheral parenteral nutrition) was started on the 6th day of MIE and continued for 9 days. Parenteral solutions were prepared in a compounder. During the first 4 days of PPN therapy, 900 kcal 1500 mL solutions were prepared. On the 15th day of MIE, a central catheter was inserted. For the first 6 days of the central catheter, 1600 kcal 2084 mL parenteral solutions were prepared. Until the 26th day 1800 kcal 2356 mL parenteral solution was given. On the 27th day of MIE, the patient's temperature was 38°C, and the catheter was changed due to central catheter infection. Consequently, 1400 kcal 2406 mL PPN solution was administered on the 27th day of MIE. The flow from the tube thoracostomy decreased and a stent was inserted due to leakage in the gastric stapler line. The patient was continued to recieve 1800 kcal 2336 mL parenteral solution on the 27-29th day of MIE. On the 30th day, a nasojejunal (NJ) tube was inserted after the stent and EN combined with CPN therapy (on the first 4 days 1400 kcal 2047 mL and on the 5th day 1000 kcal 1428 mL was performed until the daily EN intake was 60 % of daily energy requirement) was continued with semi-elemental enteral solution (1mL/1 kcal) at a rate of 10 mL/hour. EN was given for 20 hours per day (4 hours rest) with a continuous enteral pump, and the rate was increased by 10 mL every 24 hours. He reached the targeted EN dose on the 39th day. Tube thoracostomy was removed on the 44th day and antibiotherapy was continued because of fever. Regimen 1-2 transition diet (tea, diluted yogurt, fruit juice, smooth compote, smooth soup) was given on the 62nd day. The stent and NJ tube were removed 2 days after oral nutrition. However, oral nutrition was stopped due to anastomotic leakage. PPN (1000 kcal 1440 mL commercial solution) was given for 11 days (Table 1). Then, oral nutrition was improved, and he was discharged on the 86th day with oral nutritional supplements.

Main Points

- Nutrition is an important therapy as much as medical treatment in cancer.
- Enteral nutrition should optimal feeding route after esophagectomy.Early enteral nutrition can improve postoperative recovery.
- Multidisciplinary approach is necessary in enteral nutrition timing and type of enteral nutrition selection.

Table 1. Postoperative nutrition history

Day of MIE	Nutrition Therapy Way and Energy İntake
6-14th	900 kcal 1500 mL PPN
15-21th	1600 kcal 2084 mL CPN
21-26th	1800 kcal 2356 mL CPN
27th	1400 kcal 2406 mL PPN
28-30th	1800 kcal 2336 mL PPN
31-34th	1400 kcal 2047 mL PPN + semi-elemental enteral solution
35th	1000 kcal 1428 mL PPN + semi-elemental enteral solution
36-59th	100 mL/hour EN (2000 kcal)
62-64th	Oral nutrition (regimen1-2)

The patient was admitted to the hospital with nausea and vomiting 2 days after discharge. He was advised to eat small snacks. Because of the COVID pandemic, he could not come to the hospital for one year. After a year, endoscopy was performed. Stenosis, fistula (with diffuse wall thickening measuring 7 mm at its thickest part), and bleeding were observed at the anastomosis site, and hemoclips were discarded. No significant difference was found compared to the early postoperative radiological reports.

He lost 20 kg in 19 months of therapy period and was diagnosed with cachexia due to systemic inflammation. His final body weight was 60 kg and his body-mass index was 20.7 kg/m^2. He has no problems with food consumption and swallowing. He continues regular check-ups in the oncology outpatient clinic.

DISCUSSION

The esophagus is the center of the gastrointestinal system. It is a transporter of nutrients between the mouth and the stomach. If this mechanism is damaged due to any reason (e.g. ingestion of corrosive agents, hot drinks, etc.), it can lead to malnutrition, dehydration, electrolyte depletion, and starvation.

Due to both damage and obstruction of the esophagus, patients undergo modern multimodal therapies that require chemoradiation or chemotherapy before surgery. As the only curative option, surgery after neoadjuvant treatment is the mainstay of therapy in this setting. However, many patients are at risk for developing postoperative complications related to the complexity of the surgical procedure.[3] Because of complications (e.g., anastomotic leakage, pneumonia, chylothorax, etc.), the timing and type of postoperative feeding remains a matter of debate. Three major nutrition therapies are described in the literature: EN, PN and combined NT. Thirty randomized controlled trials demonstrated that there was no difference in mortality between PN and EN, whereas PN was associated with increased infectious complications, catheter-related infections, and longer hospital stays.[9] Since the patient was referred to our clinical nutrition unit for nutritional treatment only 4 days after the MIE operation, the insertion of the stent may not have provided an advantage in terms of earlier administration of the enteral route and prevention of the septic complications associated with parenteral nutrition.

Anastomotic leakage after MIE was another major complication seen in this case. Possible after postoperative fistula development and PN was the only option. After 12 days of CPN therapy, a central catheter infection developed and the catheter was replaced with a new one. Conservative non-invasive approaches include nil by mouth, antibiotics, placement or maintenance of a nasogastric tube, maintenance of drains if effective, and NT.[10] A nasojejunal tube was placed after the stent insertion, and combined NT was started with antibiotherapy. Combined NT (EN and PN) may be an option to achieve recommended energy and protein goals. EN alone is often insufficient to achieve energy and protein targets in the acute phase of critical illness.[11,12]

ESPEN recommends that the total energy expenditure of cancer patients be assumed to be similar to that of healthy subjects, generally ranging between 25 and 30 kcal/kg/day with 1.5-2.0 g/kg/day protein.[13] According to the recommendation, 1600-1920 kcal/day energy and 96-128 g/day protein were planned to supply with NT. However, it cannot be possible during PPN (because of the osmolarity limit maximum energy and protein were 1400 kcal-62,72 g respectively). Since adequate macro and micronutrients could not be provided, combined NT could be achieved with the NJ tube inserted at the time of stent placement. Oral intake was not feasible due to anastomotic leakage, which occurred on the 2nd day after the removal of the stent and NJ, necessitating the continuation of PPN.

This patient is one of the unique cases of a successful NT, which was still significant two years after discharge. Every patient diagnosed with cancer should be evaluated nutritionally before and during treatment. When cancer cachexia develops, irreversible severe muscle and fat loss can occur and difficulties in NT can be experienced. A multidisciplinary approach should be employed in treatment..

Informed consent: Written informed consent was obtained from all patients who participated in this study.

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