



Alternative Administration of Artificial Feeding with Hemp Oil in a Patient with Esophageal Ca

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Abstract

Esophageal Cancer (EC) has the sixth-worst prognosis because of its aggressiveness and poor survival. Patients with EC are malnourished due to anorexia, dysphagia, pain, and hypercatabolic state, which results in cancer cachexia and high mortality rates. Oral feeding usually remains inadequate to cover nutritional needs, while Enteral Nutrition (EN) remains the recommended solution. Here, we report on a 78-year-old male diagnosed with tumor of the esophagus with dysphagia and cachexia under opioid therapy, who fed on Percutaneous Endoscopic Transgastric Jejunostomy (PEG-J) after undergoing surgery. In contrast with the usual clinical practice for semi-elemental formulas via jejunostomy, we fed with a polymeric solution to cause temporarily normal defecation in the presence of morphine-induced constipation. The family decided to administer hemp oil to the patient alternatively with morphine. Surprisingly, the polymeric formula was well tolerated, weight and muscle mass increased, and nutrition indices improved. In addition, the use of hemp oil contributed to pain alleviation. Following this experimental approach, the patient gained weight, sarcopenia was revoked in a short time, as depicted from the computed tomography, and tumor size was reduced by 30%. The clinical observation in this study poses questions about the potential benefits of hemp oil in cancer patients.

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Keywords: Esophageal cancer; Enteral nutrition; Jejunostomy; Polymeric formula; Hemp oil.

Abbreviations: AC: Adenocarcinoma; AQP3: Aquaporin-3; CT: Computed tomography; EC: Esophageal cancer; EN: Enteral nutrition; MIC: Morphine-induced constipation; PEG-J: Percutaneous endoscopic transgastric jejunostomy; SCC: Squamous cell carcinoma; SMI: Skeletal muscle index.

Introduction

It is well established that Esophageal Cancer (EC) is fatal due to its aggressive nature, while its incidence is assumed to increase in the coming years [1]. The early diagnosis is crucial for survival [2], but the prognosis remains poor within the 5-year survival to be rare [3]. EC is divided into two major histological subtypes, Squamous Cell Carcinoma (SCC) and esophageal Adeno Carcinoma (AC). The incidence rate of SCC is more common

in Asia (79%), whereas AC occurs more frequently in Western nations [4,5]. Sex, advancing age, white race, gastroesophageal reflux disease, Barrett's esophagus, obesity, and smoking are some of the risk factors for AC [6]. Furthermore, smoking and alcohol consumption are the dominant causes of SCC [7].

Dysphagia is a prominent symptom in more than 90% of patients [8], with 40-80% suffering from weight loss, chest discomfort, burning retrosternal pain, nausea, and malnutrition at the



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initial diagnosis [9], a fact that is associated with shorter survival [10, 11]. Given the late symptomatic manifestations of EC, many patients are diagnosed with advanced disease, resulting in poor survival rates [12]. Esophageal obstruction is the leading cause of malnutrition in these patients. Malnutrition occurs by reduced energy and protein intake and leads to imbalances in body composition. More specifically, malnourished patients appear to have decreased fat-free mass, whereas the fat mass could be stable. As EC probably will result in permanent anatomical change, focus on nutritional aspects is required. When oral feeding is not feasible, EN through ostomies is recommended to improve nutritional status. EN is well tolerated by most patients, while early administration significantly improves nutritional status [13,14]. A study in patients with EC under neoadjuvant chemotherapy and jejunostomy showed that EN increased serum albumin levels and modified Glasgow prognostic score. Additionally, a significant reduction in total serum protein, albumin, hemoglobin concentrations, and prognostic nutritional index occurred in patients without jejunostomy [15]. The present paper intends to highlight the benefits of a polymeric solution and hemp oil to a patient diagnosed with EC, malnutrition, and Morphine-Induced Constipation (MIC), fed with jejunostomy.

Case presentation

A 78-year-old male was diagnosed with EC (leiomyosarcoma) at an advanced stage, with symptoms of dysphagia and cancer cachexia. Leiomyosarcoma constitutes about 0.5% of the malignant neoplasms of the esophagus. It is characterized by elongated cells forming interlaced bundles and possibly arises from the muscularis mucosa [16]. His physical examination was unremarkable. He had no loss of appetite but a loss of weight (Body Mass Index 19,1). A Computed Tomography (CT) scan showed a soft tissue mass in the area of the hepatogastric ligament and the physicians decided to remove the tumor. The surgery revealed mass infiltration in the aortic artery and in descending thoracic aorta, thus surgical resection was not possible. Chemotherapy and radiotherapy were the second therapeutic option, because of hematological toxicities, the patient did not complete the cycles. The palliative care included drug treatment with antibiotics and morphine patches and medical nutrition therapy with semi-elemental formula via jejunostomy according to patients' needs. The morphine prescription caused MIC and further discomfort. To improve intestinal motility, the flow of the semi-elemental solution was reduced and gradually stopped, and experimentally replaced with a polymeric solution in combination with a pharmaconutrient (hemp oil). Gradually weight and muscle mass increased, nutrition indices improved and tumor size reduced by 30% (6.3 cm initial diameter versus 4.5 cm five months later).

Discussion/conclusion

The jejunum cannot digest macronutrients due to the lack of pancreatic enzymes and bile acids, while its dominant function is the absorption of nutrients. Nutritional support in patients with jejunostomy is provided via semi-elemental solutions. These formulas contain easily absorbed oligopeptides (oligosaccharides and medium-chain triglycerides).

Anticancer therapies in late stages usually include opioids for pain relief. Though, opioid drugs are known to inhibit gastric emptying and peristalsis, delay the absorption of medications

and increase the absorption of fluids. Morphine increases the Aquaporin-3 (AQP3) expression in the colon and promotes water absorption from the luminal to the vascular side. The lack of fluid in the intestine leads to constipation [17]. Cannabis is an alternative analgesic treatment with positive effects in pain alleviation for cancer patients [18]. Cannabinoids are chemical compounds that affect neurotransmitter release and could be helpful for patients with chronic pain from inflammatory or neuropathic conditions [19]. However, there is insufficient evidence in the literature regarding the effects of cannabis on intestinal motility and stool frequency [20].

In this case, the choice of the polymeric formula was based on the theory of macronutrient insufficient absorption and the adverse effect of diarrhea as a consequence. Primarily, we planned to relieve the discomfort from constipation for a short time, without drugs the -patient's wish- and then return in the semi-elemental solution. When the patient gained weight from the first week and, at the same time, tended to have normality in his bowel habits, we decided to continue this practice.

Sarcopenia was an additional problem we had to manage. It is a syndrome, characterized by a decline of skeletal muscle plus low muscle strength and/or physical performance and is associated with poor physical function, lower quality of life, surgical complications, cancer progression, and reduced survival [21,22]. Sarcopenia is defined as a Skeletal Muscle Index (SMI) lower than the selected cut-off value. Our patient underwent a CT scan after the initial diagnosis. The total skeletal muscle visualized at the level of the L3 vertebra and SMI measured at 36cm², value much lower than the cut-offs (SMI < 55 cm² /m² in males and < 39 cm² /m² in females)[20].

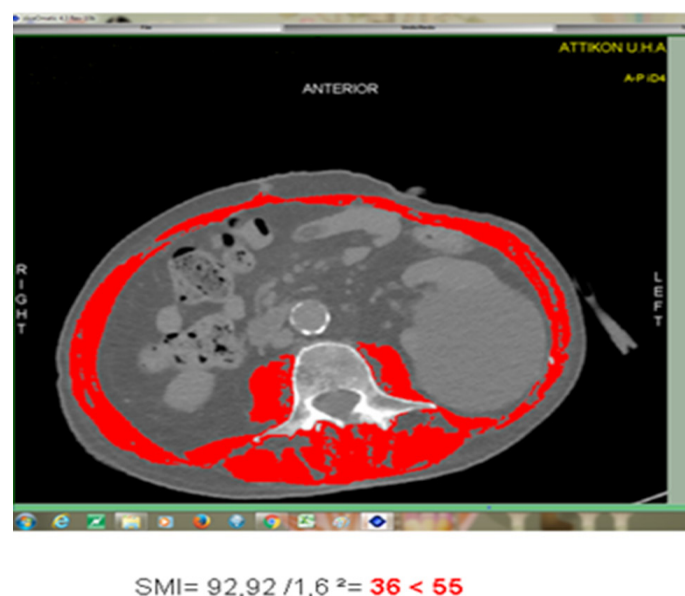


Figure 1: Cross-sectional computed tomographic image at the third lumbar vertebral level after cancer diagnosis (June 2017). SMI 36.8 cm². Muscle mass is depicted with red color whereas grey is fat mass and organs' tissue. Skeletal muscle area was quantified using the threshold values of -29 to 150 Hounsfield units (Slice-O-Matic 4.3 software; TomoVision Montreal, QC, Canada).

Repeat CT scan five months later showed an increased SMI, even if it was still lower than the normal values (Figure 2).



SMI= $107,6 / 1,6^2 = 42 < 55 \text{ cm}^2/\text{m}^2$

Figure 2: Cross-sectional computed tomographic image at the third lumbar vertebral level five months after cancer diagnosis (November 2017). SMI 42 cm^2 .

The continuous screening and quantitative assessment of patients' nutritional intake helped to improve the overall condition and offered a better quality of life. His positive response to experimental nutritional intervention showed improved nutritional status, muscle mass, stool frequency, and consistency. These results are in accordance with Boland's 1986, which tested a non-elemental formula in undernourished patients with cystic fibrosis with no complications resulting from jejunostomy feeding [23].

This clinical case highlighted the importance of individualized nutritional therapy and gave an alternative option for cancer patients with jejunostomy and MIC. Further studies are needed to investigate the use of polymeric solutions in the jejunum and the possible benefits of cannabis (hemp oil) in cancer patients.

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