

**Research Note****Nutrition Support Following Enhanced Recovery After Surgery Protocol for Malnourished Cancer Elderly Patient**Chiou Yi Ho<sup>1\*</sup>, Aini Masitah Mohammad<sup>1</sup>, Jamil Omar<sup>2</sup>, Atiki Falparado Ahmad<sup>3</sup><sup>1</sup>*Department of Dietetic and Food Service, National Cancer Institute, Ministry of Health, Malaysia*<sup>2</sup>*Department of Surgical Oncology, National Cancer Institute, Ministry of Health, Malaysia*<sup>3</sup>*Department of Surgery, KPJ Selangor Specialist Hospital, 40300 Shah Alam, Malaysia.*

**ABSTRACT** Short-term nutritional optimization before surgery and Enhanced Recovery After Surgery (ERAS) protocol aimed to achieve early recovery after surgery by maintaining preoperative organ function and reducing the profound surgical stress response. *Case presentation:* A 83-years-old female patient with Rectal Adenocarcinoma with Locoregional Infiltration of Uterus was started intensive nutritional intervention fortnight pre-operation. The patient was cachexia with 33 kg; loss of 2 kg within 1 month; PG-SGA score 13 (severe malnourished); She experienced very poor oral intake for the past 1 month. Total intake was 770 kcal and 33 g/day protein. Oral nutritional support (extra 500kcal) was given. The phone call and home-visit were conducted to ensure compliance of the nutritional intervention. Upon admission, the patient gained 0.9 kg; increased intake 1542 kcal/day with 76g/day protein. ERAS protocol with preoperative carbohydrate loading and postoperative early oral feeding was implemented. Length of hospital stay was 6 days 16 hours, clear fluid toleration was 20 hours, solid food toleration was 5 days and gastrointestinal function (flatus and bowel open) was 3.5 days. *Discussion:* Advanced age is a proven risk factor for postoperative complications. Intensive nutrition support, which involved phone call and home-visit, was proven to facilitate compliance towards nutrition counselling. Integrating nutritional support following perioperative ERAS protocol showed combination outcomes where increased nutrition intervention compliance and shorten length of hospital stay without compromise complications for the malnourished elderly patients. *Conclusion:* Nutrition support following the ERAS protocol was beneficial for malnourished cancer elderly patients.

**Keywords:** Nutrition support, ERAS, malnourished, elderly.

**INTRODUCTION**

Cancers are one of the leading causes of morbidity and mortality worldwide. There is frequent development of malnutrition and metabolic derangement among cancer patients due to increase nutrients requirements and reduced oral intake. Treatment of cancers includes surgeries, radiotherapies, and pharmacological therapies. Surgery leads to inflammation and metabolic stress response. Surgical stress and trauma will induce further catabolism of nutrient storage in the body (glycogen, fat, and protein) among cancer patients (1,2). Pre-operative prehabilitation was recommended to optimize nutritional status patients before elective operation (1).

Nutrition intervention is the key element in preoperative management phase (3). Nutritional counseling and provision of oral nutrition supplement preoperative has been shown to significantly increase energy and protein intake (4). As per the recommendation in Enhanced Recovery After Surgery (ERAS) and European Society for Parenteral and Enteral Nutrition (ESPEN) 2017, shortening the preoperative fasting via carbohydrate

(CHO) loading and postoperative early initiation of oral feeding, early mobilisation, minimal invasive surgery, and multimodal pain management with minimal opioid usage improved postoperative outcomes and without increased postoperative readmission rate (1,5). The purpose of this case report is to share our clinical experience with the practice of nutrition support following with ERAS protocol for malnourished surgical cancer elderly patients.

**Case presentation**

An 82-years-old female patient was diagnosed with rectal adenocarcinoma with local infiltration to the right side of the uterus, elective admitted for colon resection low anterior resection with Total Abdominal Hysterectomy with Bilateral Salpingo-Oophorectomy operation fortnight. The patient first presented to a multidiscipline clinic, with low Body Mass Index (BMI) 14.7 kg/m<sup>2</sup>, cachexia looking, and lost weight 7 kg within one month. Nutritional assessment using PG-SGA, found that patient was moderately malnourished with PG-SGA score 14, and albumin level was 30 g/L. Patient-reported

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significantly reduced appetite and poor oral intake for the past 1 month with an estimated oral intake of 450 kcal and 15 g/day protein. Nutritional diagnosis for her was unintentional weight loss related to inadequate oral intake as evidenced by poor oral intake and weight loss. Intensive nutrition intervention pre-operative which included individualized nutritional counseling (where individual energy and protein intake were calculated based on Medical Nutrition Therapy protocol for cancer patients) (6), oral supplementation support, and home-visit follow-up was started two weeks before the operation to optimise nutritional status before admission. After elective operation admission, protocol (ERAS) with carbohydrate loading and early oral feeding post-operation was implemented as well. Specific drink with carbohydrate plus whey protein was served as carbohydrate loading drink. As one of the elements in ERAS (preoperative carbohydrate loading), the patient was loaded with 100 g carbohydrate and 18 g of whey protein as evening drink and 50 g carbohydrate and 9 g whey protein 3 hours pre-operation. Postoperative early oral feeding (allowed

clear oral nutrition supplement 6 hours after operation) was implemented for this patient. After tolerated with 750 ml clear oral nutrition supplement on the post-operation day 1, the patient started a solid diet on post-operation day 2; tolerated well with solid food on post-operation day 5 and allowed discharged on post-operation day 6. Anthropometry was measured by using calibrated body composition analyzer, TANITA model SC 330. As a summary, length of hospital stays was 6 days 16 hours, clear fluid toleration was 0.8 day, solid food toleration was 5 days and gastrointestinal function (flatus & bowel open) was 3.5 days. There were no incidents regarding postoperative ileus, wound breakdown, infection, or pneumonia recorded for this patient. Intensive nutritional intervention (counseling and oral nutrition supplement prescription) was given to the patient throughout the hospitalization and after discharge. The patient reported good improvement in appetite and more cheerful. She gained weight and muscle mass and achieved adequate oral intake with oral nutrition supplement upon 1-month follow up.

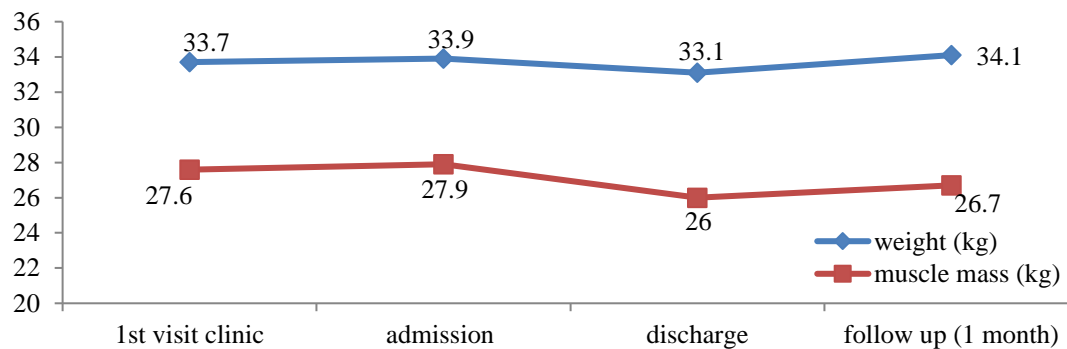


Figure 1. Perioperative Anthropometric Changes

Table 1. Daily total energy and protein intake

	1 <sup>st</sup> visit clinic	Admission	Discharge	Follow up (1 month)
Daily total energy intake (kcal/day)	770	1542	830	1492
Daily total protein intake (g/day)	33	76	42	62.4

**DISCUSSION**

In this study, we able to demonstrate that intensive nutrition intervention can maintain patient weight preoperatively, as shown in figure 1. It is important to ensure weight loss among cancer patients not reduce further preoperatively because weight loss will influence survival during recovery. For instance, Iseering et al. (2004) found that intensive nutrition intervention with regular follow-up helped attenuate weight loss in the intervention group compared to those subjects in usual care group (7). In the study, subjects in the intervention group,

comprised of gastro intestine or head and neck patients, who have received early nutrition counseling, telephone reviews, and oral nutrition supplement showed more weight stable among subjects.

As shown in Table 1, the energy and protein intake of patient improve preoperatively from baseline. These results were similar in the study conducted by Macfie et al. (2000). The study shows that patients, who received oral nutrition supplement, significantly reported higher energy and protein intake compared to patients who are not received oral

nutrition supplement during preoperative outpatient phase (4). Other studies also documented that oral nutrition supplement has proven effective at increasing the nutritional intake of the patients (8). Stratton et al suggested that positive outcome seen in patients given with oral nutrition supplement was associated with the minimal effect that liquid supplements probably have on appetite and voluntary food intake (increasing total energy and protein intake) (8).

Our study supports the findings of many studies that conclude that oral nutrition supplement is able to increase total energy and protein intake. It is believed that adherence patients toward oral nutrition supplement regime and nutrition counseling play an important key in the positive outcome seen. It is suggested that adherence towards dietary advice and oral nutrition supplement prescription could be achieved if patient receives encouragement by a dietitian. As for this patient, we developed a monitoring system where a patient was followed up by the dietitian by phone call and a home visit. During phone and home visit follow-up, patients were educated on how to manage symptoms, provide encouraging words to maximize health, and most importantly ensure calorie and protein requirements achieve. These beliefs to be drivers for dietary manipulation as well (9,10).

Phone counseling is feasible and helpful in improving the outcome of the treatment, whereby the respondent rated counseling relationship and level of interpersonal influence similar to face to face counseling (9,10). The rapport developed during phone counseling also believes to facilitate on-going participation in the study (10). Besides, a comprehensive approach given during home visit which includes motivation and individual education especially for an elderly patient is proven effective in improving nutritional outcome (12).

Elective surgery has been shown to reduce in surgery stress, minimize catabolism, and support anabolism throughout surgical treatment and promote speedy recovery process if compare to emergency surgery. Traditionally, the patient was kept nil-by-mouth before surgery. A nasogastric tube was used to clear stomach content and withheld oral feeding until resolution of the postoperative ileus because the patient was believed that unable to tolerate early feeding. Once bowel function returned with bowel sound, the patient was allowed for clear fluid as standard post-operation drink and step up feeding/diet accordingly (3). However, researches have proven that ERAS whereby patient was allowed for solid food 6 hours and clear fluid 2 hours before surgery as well as early oral feeding on the first day of post-surgery length of hospital stays, length of bowel function return and length of solid food toleration significantly (3,13,14,15,16).

Advanced age is shown as the risk factor of postoperative complications. A study showed that elderly patients' postoperative morbidity rate and mortality rate were significantly higher if compared with younger patients (14). The elderly probably takes longer time to recover from anesthesia and their ileus rate after surgery is higher if compared with younger patient (15). Traditional perioperative care patient's length of hospital stays after elective colorectal surgery was reported around 10 to 15 days

and was associated with a delayed return of bowel motility (16,17,18,19). This patient was recorded similar outcomes with previous study findings that a significant reduction of 2 days in length of hospital stays was achieved after implementing ERAS (8 days vs. 6 days;  $p < 0.0001$ ) without increasing readmission rate in elderly patients who underwent elective colorectal surgery (21).

Good compliance with the ERAS protocols also resulted in faster peristalsis return and earlier bowel movement which was 2.5 days postoperatively on average, regardless of the age of patients. Patients hospitalized up to 10 to 15 days and with delayed bowel motility post-operatively under traditional care (19,20,22). Studies also proved that significantly shorten the length of hospital stays, and reduced the number of postoperative complications (17,18). Post-surgery complication rate, length of hospital stays and length of solid food toleration indicate successfulness of ERAS protocol implementation. There are no significant differences in length of stay post colorectal operation between younger and older age groups of patients; the mean of hospital stay was 5 days (18). Both younger and older groups of patients reported that able to tolerate early postoperative oral fluid and food intake (21).

This case report is supported by previous studies result whereby elderly patient benefited via ERAS protocol post-operatively. ERAS protocol did not show to be harmful in elderly surgical patients; instead, it has comparable positive outcomes as younger surgical patients (23,25).

## CONCLUSION

Nutrition support following ESPEN which recommended preoperative early nutrition support and ERAS protocol was beneficial to this patient. Preoperative prehabilitation optimize the nutritional status of patients before elective operation while ERAS protocol boosts postoperative recovery, and shortened length of hospital stays, length of bowel function return, and length of solid food toleration without compromised postoperative complications or readmissions.

## CONFLICT OF INTEREST

The authors declare no conflict of interest arising from the findings for the reported case and its management.

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