



Clinical observations of the effect of continuous enteral nutritional support through an indwelling jejunal feeding tube in the abdominal wall on improving subjective well-being after surgery and during chemotherapy

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Contributions: (I) Concept and design: L Li; (II) Administrative support: M Li; (III) Provision of study materials or patients: L Li, L Sui, Y Wu; (IV) Collection and assembly of data: Y Wu; (V) Data analysis and interpretation: T Hao, M Li, L Li; (VI) Manuscript preparation: All authors; (VII) Final approval of the manuscript: All authors.

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Background: Oral nutritional support is a general means of nutritional support after gastric cancer surgery and during postoperative chemotherapy. The main deficiency of oral nutritional support is that patients, due to various factors, cannot intake enough calories, resulting in poor nutritional support. Therefore, it is necessary to explore a nutritional support means that can ensure energy intake and to explore the significance of continuous enteral nutrition in improving the subjective tolerance of patients after gastric cancer surgery and during postoperative chemotherapy.

Methods: Twenty-eight patients with gastric cancer were divided into 2 groups: 13 cases in group A and 15 cases in group B. Group A was the observation group, in which an indwelling jejunal feeding tube was placed intraoperatively through the abdominal wall; enteral nutritional support was provided during postoperative treatment and postoperative chemotherapy and continued until the end of chemotherapy. In group B, a jejunal feeding tube was not placed during surgery; therefore, enteral nutritional support was not provided during postoperative chemotherapy. The subjective overall well-being and subjective physical status of patients in the 2 groups during chemotherapy were observed and compared.

Results: The subjective overall well-being and subjective physical status of patients in group A were better than those in group B. However, there was no significant difference in subjective overall well-being, but there was a significant difference in subjective physical status.

Conclusions: Enteral nutritional support with an indwelling jejunal feeding tube after gastric cancer surgery until the end of chemotherapy is one a feasible measure and is beneficial to the rehabilitation of patients and the implementation of chemotherapy. However, further studies with larger samples and more clinical data are needed.

Keywords: Gastric cancer; enteral nutrition support; subjective well-being

Received: 01 March 2019; Accepted: 11 July 2019; published: 31 July 2019.

doi: 10.21037/dmr.2019.07.02

View this article at: <http://dx.doi.org/10.21037/dmr.2019.07.02>

Introduction

Food intake by patients after gastrointestinal cancer surgery is influenced by various subjective and objective factors. Because of the surgery and the effects of chemotherapy after surgery, energy intake by patients is inadequate. As a common practice, patients are encouraged to ingest more calories orally or an indwelling jejunal feeding tube is placed through the nose. However, even with encouragement, patients are still unable to ingest enough food, and patients do not well tolerate the indwelling jejunal feeding tube through the nose. Conventional nutritional support often leads to feeding interruption (1). Clinical observations have shown that a poor nutritional status can lead to a poor psychological status (2). It is of great clinical importance to seek a method of feeding that neither depends on subjective factors of the patient nor has tolerance issues due to patient discomfort. The authors intraoperatively placed an indwelling jejunal feeding tube through the abdominal wall for nutritional support until the end of all courses of chemotherapy for patients with gastric cancer, which could solve the above clinical problems and did achieve good preliminary results.

Methods

Patient data

A 1-year observational study was conducted with gastric cancer patients who underwent postoperative chemotherapy and nutritional support. The study was approved by an ethics committee. The inclusion criteria were patients with tumor-node-metastases (TNM) stage II, IIIa or IIIb gastric cancer. The exclusion criteria were the occurrence of surgical complications or the inability to complete the nutritional support treatment. The postoperative chemotherapy regimen was 8 cycles of capecitabine plus oxaliplatin (XELOX). A total of 38 patients who met the inclusion criteria were enrolled. The patients were divided into 2 groups. This was a non-double-blind clinical observation study. The grouping scheme was nonrandomized. The patients who were willing to receive a long-term indwelling jejunal feeding tube through the abdominal wall during surgery were selected as the observation group (group A), and those who were not willing to receive a long-term indwelling jejunal feeding tube through the abdominal wall were the control group (group B); there were 13 cases in group A and 15 cases in group B. In group A, during the operation, an indwelling

jejunal feeding tube was placed through the abdominal wall. The jejunal feeding tube entered, via puncture, into the intestinal lumen 30 cm from the anastomosis, with an indwelling length of 20 cm in the intestinal lumen. In addition, the jejunal feeding tube exited the left abdominal wall via puncture. The seromuscular layer and peritoneum at the jejunal puncture sites were sutured. The patient visited the hospital once a week for jejunal feeding tube maintenance. During postoperative treatment and postoperative chemotherapy, the patient received continuous enteral nutrition until the end of chemotherapy. In group B, no jejunal feeding tube was placed during surgery, and there was no enteral nutritional support during postoperative chemotherapy.

Nutritional support program

Group A: the patients began receiving enteral nutrition in the perioperative period, and the enteral nutrient solution used was a preparation containing 1 kcal/mL cellulose. The patient was discharged after being able to tolerate 1,000 mL of gravity infusion. After discharge, the patient was given enteral nutrition support at home; the nutritional support program was determined according to each patient's food intake. If food intake was less than half of the required amount, then 1,000 mL of enteral nutrition solution was used; if food intake was more than half of the required amount, then 500 mL enteral nutrition solution was used. During chemotherapy, the same regimen was used. If food intake was less than 1/4 of the required amount, then the patient was given 1,500 mL of enteral nutrition solution under the guidance of a dietitian. For maintenance of the nutrition tube, the patient visited the hospital once a week, and placement of the jejunal feeding tube was examined to ensure that it would not come out.

Group B: after recovery from surgery, the patients' diet was gradually transitioned to normal, and dietary guidance was provided as supportive treatment after discharge and during chemotherapy.

Observation indicators

The subjective overall well-being of the patients was used as a comprehensive indicator of mental and physical state, and the subjective physical status was used as the observation indicator of physical condition. The evaluation indicators were categorized as good (no difference in subjective well-being), fair (could tolerate treatment and perform ordinary

Table 1 Subjective well-being of the patients

Control group	Good	Fair	Poor	Total	Effective rate (%)	z	P
Subjective overall well-being of the patients						1.824	0.068
A	9	2	2	13	69.2		
B	4	8	3	15	26.7		
Subjective physical status of the patients						2.412	0.016
A	9	3	1	13	69.2		
B	3	9	3	15	20.0		

The effective rate refers to the ratio of patients with good subjective well-being to total patents in the group.

daily activities, but subjective well-being was slightly worse than usual) and poor (could tolerate treatment, but subjective well-being was substantially worse than usual). The evaluation was conducted by a professional nutrition support nurse who asked each patient questions. Using this evaluation method, the patient made a comprehensive subjective evaluation of self-experience based on their experience, including psychological status, physical status, and response to treatment, during the entire treatment period. The answers by the patients were recorded by the interviewer.

Statistical methods

SPSS 13.0 was used to perform the Mann-Whitney U test for count data. During the analysis, the nutritional support measures were considered to be effective if the patient's subjective well-being was good; if the patient's subjective well-being was fair, the nutritional support method was considered not effective. Therefore, fair and poor well-being were combined for the analysis. $P < 0.05$ was considered statistically significant.

Results

Patients in group A had high compliance with the indwelling jejunal nutrition tube. There were no complications, such as diarrhea or obvious abdominal distension, during enteral nutritional support, and daily life was not affected. Patients in group A had better subjective well-being. The subjective experience of patients in groups A and B during chemotherapy is provided in *Table 1*.

Discussion

At present, the mainstream nutritional support for

chemotherapy after gastrointestinal surgery is oral nutritional support, and the focus of studies has been relevant nutritional assessment indicators and improved prognosis (3). Most clinical studies conclude that nutritional support is beneficial to patients. Multicenter studies have shown that (4) enteral nutritional support during the treatment of upper gastrointestinal cancer after surgery is simple and feasible and can limit further loss of body weight. These studies have focused on the body and the disease but paid less attention to the subjective well-being of patients, thus not exactly embodying the human-oriented medical concept. We believe that, aligning with modern medical concepts, the subjective well-being of patients during treatment is an important medical quality measure. Studies have shown that a poor nutritional status can lead to a poor psychological status (5). We also noticed in clinical practice that nutritional status interacts with response to treatment and physical status, forming a vicious cycle that affects the subjective well-being of patients and their acceptance of treatment.

In the clinical observation group, the patients received an indwelling jejunal feeding tube placed through the abdominal wall. The jejunal feeding tube had a small diameter and was soft and thus was unlikely to have a substantial impact on patients' lives; therefore, the patients had a high degree of acceptance. This procedure avoids the discomfort of a nasal indwelling jejunal feeding tube. The method investigated in this study can not only help achieve daily nutritional support goals and avoid energy deficiency but can also allow the patient to maintain a good physical state and a good mental state, which is beneficial to postoperative rehabilitation and chemotherapy. In terms of nutritional support, enteral nutrition is a relatively simple nutritional support method and, hence, can be safely implemented at home (6) with very few complications (7). In this study, energy intake requirements were estimated using the usual food intake of the patients, a highly feasible and

easy approach that patients can master. The average person usually consumes 2,000 kcal per day. The energy content of the commercial nutrient solution (500 mL per package) was 1 kcal/mL. Therefore, if a patient's food intake was half of the required amount, then 2 bottles of enteral nutrition solution met the basic needs for a single day. In addition, considering that 2 bottles of enteral nutrition solution contained 1,000 mL, the patient was discharged only after tolerating 1,000 mL of tube feeding by gravity infusion; thereafter, nutritional support was carried out at home, and the patients had good tolerance. A previous study (8) has shown that after esophageal and gastric surgery, enteral nutrition via a jejunostomy tube can improve the nutritional status of the patient and, at the same time, does not affect oral food intake. Patients are still able to consume food orally to satisfy physiological needs. In addition, compared with ordinary food, nutrient solutions can provide more balanced nutrients and provide more optimized nutrition support. If a patient's food intake is affected greatly and food intake is limited during chemotherapy, 1,500 mL of enteral nutrition solution can be used. This larger amount of enteral nutrition can be implemented in a hospital setting to ensure better administration. Therefore, the nutritional support method used in this study is simple and feasible and is suitable for promotion.

Normally, physical or chemical indicators are used for comprehensive evaluations in nutritional assessments. However, current physical measurement indicators and biochemical indicators lack specificity for nutritional assessments and cannot reflect the state of human nutrition. The role of nutrition is to provide the material basis for the composition of the body and, at the same time, to play a physiological role. At present, most nutritional monitoring indicators can only reflect material composition, and some indicators can reflect function, such as grip strength. The subjective well-being of a patient is also a reflection of the role of nutrients. An important indicator of a healthy body is sufficient subjective physical strength and good self-worth. Studies have shown that the basis of these 2 indicators is a healthy nutritional state, but these 2 indicators can only be experienced by patients themselves and are a challenge to detect by physical or chemical methods. A good nutritional status can improve the quality of life of patients with upper gastrointestinal cancer (9). A study by Vashi *et al.* (10) showed that parenteral nutrition at home can improve the quality of life of patients; however, parenteral nutrition involves intravenous infusion, which has a high risk. In this

study, an indwelling jejunum feeding tube was safely placed through the abdominal wall, and the daily energy supply of patients was controlled. This method can provide adequate and balanced nutrients independent of patient compliance. At the same time, it can allow the psychological needs of patients to eat by mouth. Although oral nutritional support alone can satisfy the psychological need for oral energy intake, the issue of not wanting to eat needs to be overcome. Therefore, enteral nutritional support has the advantage of better subjective well-being than oral nutritional support alone. On the basis of an adequate and appropriate nutrient supply, the physical status of patients must greatly improve through feelings of adequate physical strength. This study presented a preliminary clinical observation. It can be seen from the case statistics that the effective rate of overall subjective well-being in the observation group was significantly higher than that in the control group, but the difference was not significant, which was related to the small number of cases. The subjective physical state of the patients in the observation group was significantly higher than that of patients in the control group. From these data, it can be seen that a sufficient energy supply can improve the functional status of patients, thus providing a material basis for the subjective well-being of patients and bearing important significance for a good psychological state of patients.

Taken together, an indwelling jejunal feeding tube placed through the abdominal wall during gastric cancer surgery ensures sufficient daily energy intake, thus achieving the goal of nutritional support after gastric cancer surgery and during chemotherapy and improving the nutritional status of the patient. This method provides an important basis for the subjective physical well-being of patients and has important significance for patients successfully completing various treatments. However, this clinical observation is only preliminary. The sample size was small, and the study was not a randomized controlled clinical trial; therefore, well-designed clinical studies are needed to further confirm the results.

Acknowledgments

Funding: Science and Technology Project of Guangdong Province, 2017A020215014, Study of the mechanism of the resistance of gastrointestinal stromal tumor stem cells to imatinib mesylate through the SCF/KIT signaling pathway, 2017.1-2019.12, ongoing.

Footnote

Provenance and Peer Review: This article was commissioned by the editorial office, *Digestive Medicine Research* for the series “Nutritional Support for Digestive Surgery”. The article has undergone external peer review.

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/dmr.2019.07.02>). The series “Nutritional Support for Digestive Surgery” was commissioned by the editorial office without any funding or sponsorship. CZ served as the unpaid Guest Editor of the series and serves as the unpaid Associate Editor-in-Chief of *Digestive Medicine Research*. LL served as the unpaid Guest Editor of the series. The authors have no other conflicts of interest to declare.

Ethics Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The patients in this study were fully informed and signed an informed consent form. This study was approved by the Ethics Committee of the Seventh Hospital affiliated with Sun Yat-sen University (Ethics approval No. 2017SYSUSH-006). The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013).

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doi: 10.21037/dmr.2019.07.02

Cite this article as: Li L, Wu Y, Li M, Huang J, Hao T, Sui L, Zhang C. Clinical observations of the effect of continuous enteral nutritional support through an indwelling jejunal feeding tube in the abdominal wall on improving subjective well-being after surgery and during chemotherapy. *Dig Med Res* 2019;2:15.

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