

原 著

# Nutritional status in long-term survivors after partial gastrectomy

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## Key words

internal organ deficit, nursing care, partial gastrectomy, weight loss

## Abstract

**Aim:** The purpose of this study was to clarify nutritional status of long-term survivors after partial gastrectomy and aspects associated with nutrition status. Based on our findings, we hoped to establish nursing care for managing nutritional status after partial gastrectomy.

**Methods:** A total of 86 subjects underwent partial gastrectomy more than 10 years previously. Physical measurements, blood examinations, and a questionnaire survey were performed. Subjects were divided into a poor nutrition group (rate of weight loss  $\geq 10\%$ ) and a good nutrition group (rate of weight loss  $< 10\%$ ) to compare physical, lifestyle-related, and psychological factors.

**Results:** About 40.5% of the patients had diabetes mellitus. Sixty-one percent of the long term survivors after partial gastrectomy were categorized into the poor nutrition group. Type of reconstruction, age, percent body fat, triceps skinfold thickness, lipid intake, hemoglobin levels, and the staple food intake were significantly different between the poor nutrition group and the good nutrition group. However there was no difference in satisfaction with life between groups.

**Conclusions:** Nursing intervention after partial gastrectomy should include nutritional management, especially regarding the form and method of lipid intake, to improve nutritional status among long-term survivors after partial gastrectomy.

## INTRODUCTION

Currently, the incidence of gastric cancer in Japan is high<sup>1)</sup>. However, early detection and improvement in surgery have improved the survival rate<sup>2)</sup>. Changes in digestive tract motor function after undergoing a gastrectomy include malnutrition related to reduction of gastric retention, absorption failure due to decreased gastric secretion and reduction of food volume<sup>3, 4)</sup>. The extent of resection needed and the type of

reconstruction procedure have developed over time<sup>5, 6)</sup>. However, most studies have focused on patients who underwent a total gastrectomy and were followed up for 10 years<sup>7)</sup>. Despite having no relapse, long-term survivors after partial gastrectomy often have a diet complaint. Some may suffer permanently from a poor nutritional status. But the nutritional status of survivors more than 10 years after partial gastrectomy is unclear. Recently, the number of patients

undergoing partial gastrectomy and surviving for more than 10 years has increased<sup>8)</sup>. Thus postoperative nutritional status and quality of life (QOL) related to a partial gastrectomy should be investigated over the long term. The purpose of this study was to investigate nutritional status, dietary intake, and satisfaction related to lifestyle and health status in patients who had undergone a partial gastrectomy 10 or more years previously.

## PATIENTS AND METHODS

### 1. Study Design

This cross-sectional observational study was carried out between November 2001 and October 2002.

### 2. Subjects

Subjects were recruited from patients diagnosed with gastric cancer who underwent a partial gastrectomy at Kanazawa University Hospital or Toyama Rosai Hospital from 1980 to 1991, where surgery is performed based on a similar operation strategy. The inclusion criteria were that participants survived in November 2001, and that participants could understand the questionnaire. The exclusion criteria were as follows: the participants who had a relapse of gastric cancer or who were later diagnosed as other cancers. The author's first contact with patients was by letter. If they agreed to participate, a time and setting for the investigation were arranged. A total of 114 subjects who underwent a partial gastrectomy from 1980 to 1991 received a letter.

### 3. Data collection

Age, gender, postoperative length, therapy, and medical history were verified from medical records. Data related to surgery were as follows: age at operation, year after surgery, type of reconstruction, lymph node dissection, No.16 lymph node dissection, combined resection of other organs, and current medical conditions. The rate of occurrence of post-operative diarrhea is known to be high in the patients receiving No.16 lymph node dissection. The reason is that No.16 lymph node dissection are related to the dissection of the superior mesenteric artery plexus<sup>9)</sup>. We

considered that the relation of diarrhea and nutritional status are important.

Physical measurements and blood examinations were performed on all patients, and they completed a questionnaire regarding nutritional intake, lifestyle, and psychological factors.

For physical measurements, parameters included body mass index (BMI), percent of body fat<sup>10)</sup>, triceps skinfold thickness (TSF), mid-arm circumference (AC), arm muscle circumference (AMC), number of teeth, and bone density. Bone density was measured by an ultrasound bone-densitometer<sup>11)</sup>. Blood examinations including total protein, albumin, blood sugar, hemoglobin A1c, hemoglobin, and total lymphocyte count were performed at the time of this survey. All measurements, excluding blood examinations, were made at least three times by the same investigator, and mean values were reported.

Nutritional intake was measured using a questionnaire regarding daily food consumption patterns and dietary styles. Based on this simple food intake survey, nutritional intake of protein, fat, and carbohydrate can be calculated<sup>12, 13)</sup>.

Lifestyle-related and psychological factors were selected based on a literature review<sup>6, 14-16)</sup> and an interview was held with 10 patients selected randomly from outpatients. The following 8 items were used as variables: performance status, size of staple food, form of staple food, size of side dishes, presence or absence of diarrhea, a visual analog scale (VAS) for evaluating health status, a VAS for evaluating nutritional status, and grade of satisfaction with life for evaluating psychological satisfaction. Scores on a VAS were estimated ranging from 0 (worst) to 10 (best). The grade of satisfaction with life for evaluating psychological satisfaction used the Ferrans and Power's quality of life index cancer version (Japanese version) (QLI-CV)<sup>17-19)</sup>. This scale consists of four subscales: health and functioning, socioeconomic, psychological/spiritual, and family. Scores of this scale were estimated ranging from 0 (dissatisfaction) to 30 (satisfaction).

### 4. Analysis

Descriptive data are expressed as mean (stan-

dard deviation) for continuous variables or n (%) for categorical variables.

Subjects were divided into a poor nutrition group and a good nutrition group. The poor nutrition group consisted of patients in whom the rate of weight loss was  $\geq 10\%$ ; the good nutrition group consisted of patients in whom the rate of weight loss was  $< 10\%$ <sup>20)</sup>. Weight loss was calculated as follows: weight loss (%) = (preoperative weight - weight at the time of the investigation)  $\div$  preoperative weight  $\times 100$ .

Differences in the impact on nutritional status were analyzed between the poor nutrition group and the good nutrition group. Statistical analysis of the differences between the two groups was performed with the t test and chi square test. A difference of  $p < 0.05$  was accepted as statistically significant. SPSS 10.1J for Windows (SPSS Japan Inc.) was used for statistical analysis.

## 5. Ethical considerations

This research conformed to the ethical guide-

lines for clinical research specified by the Japan Ministry of Health, Labor and Welfare (2002). A researcher provided oral and written descriptions of the study to patients, and informed consent was obtained. All patients had the opportunity to withdraw their participation at any time. In this study, no costs for the examinations were charged to the participants.

## RESULTS

### 1. Characteristics of participants

We sent a request form to 114 patients who had undergone partial gastrectomy, and 86 patients agreed to participate in the study (response rate: 75.4%). The questionnaire response rate was 90.7%.

Patient demographics are shown in Table 1. The patients consisted of 63 males and 23 females. Mean ( $\pm$ SD) age was 72.2 (8.7) years (range, 40-92 years). The timeframe was a mean of 15.0 (3.0) years after surgery (range, 10-21

Table 1. Characteristics of patients

Characteristic		n = 86
Gender	Male	63 (73.3)
	Female	23 (26.7)
Age (y)	(Mean $\pm$ SD)	72.2 $\pm$ 8.7
Age at operation (y)	(Mean $\pm$ SD)	57.2 $\pm$ 9.0
Year after surgery (y)	(Mean $\pm$ SD)	15.0 $\pm$ 3.0
Type of reconstruction <sup>a)</sup>	Billroth I	49 (60.5)
	BillrothII	21 (25.9)
	Substitute stomach (pouch)	10 (12.3)
	Jejunal interposition	1 ( 1.3)
Lymph node dissection <sup>b)</sup>	$\leq R2+ a$	68 (86.1)
	$> R3$	11 (13.9)
No. 16 lymph node dissection <sup>c)</sup>	Yes	10 (12.8)
	No	68 (87.2)
Combined resection of other organs	Yes	16 (18.6)
	No	70 (81.4)
Current medical conditions	Endocrine or metabolic disease	33 (38.4)
	Cardiac disease	14 (16.3)
	Hepatic disease	10 (11.6)
	Respiratory disease	7 ( 8.1)
Diabetes mellitus <sup>d)</sup>	Yes	30 (40.5)
	No	44 (59.5)

n (%), Mean  $\pm$  SD

a) n = 81 b) n = 79 c) n = 78 d) n = 74

years). At the survey, endocrine and metabolic diseases were the most common, and 40.5% of patients had diabetes mellitus.

In terms of physical measurements, patients lost 14.2 (9.0) % of their baseline weight after surgery. Among patients for whom data were available, percent of body fat and TSF were lower than the reference values. BMI, AC, and AMC were mostly the same as the reference values. (Table 2). Each item regarding nutritional intake was lower than the respective standard

value in the National Institute of Health and Nutrition in Japan, 2002 (Table 3).

In the blood examination, blood sugar was higher and total lymphocyte number was lower than the reference ranges in all patients for whom data were available (Table 4).

## 2. Characteristics of groups divided by nutritional status

In the following analyses, 13 patients (including 1 patient with diabetes) were excluded because of lack of the preoperative body weight

Table 2. Nutritional status of patients

	N	Mean (SD)	Reference value (SD) <sup>1)</sup>
Weight loss (%)	73	14.2 ( 9.0)	
BMI	62	20.2 ( 2.8)	21.56 (3.5)
Percent of body fat (%)	53	23.6 ( 5.6)	30.5 (4.1)
TSF (mm)	65	8.1 ( 5.3)	13.1 (5.8)
AC (cm)	65	24.9 ( 2.8)	25.7 (3.1)
AMC (cm)	65	22.4 ( 2.4)	21.6 (2.7)
Number of teeth (number)	65	13.4 (12.3)	10.7
Bone density (%)	35	24.2 ( 2.5)	20.7 (1.9)

1) Japanese Society of Nutritional Assessment : Japanese Anthropometric Reference Data (JARD 2001), Japanese Journal of Nutritional Assessment, 19 (suppl), 45-81, 2002  
 BMI : body mass index : TSF : triceps skinfold thickness : AC : mid-arm circumference : AMC : arm muscle circumference

Table 3. Nutritional intake of patients (n=73)

Dietary Intake	Mean (SD)	Reference value (SD) <sup>1)</sup>
Energy (kcal)	1447.0 (353.5)	1760.0 (544.0)
Protein (g)	55.0 ( 12.0)	72.9 ( 27.1)
Fat (g)	33.0 ( 11.0)	44.6 ( 20.9)
Carbohydrate (g)	193.9 ( 57.7)	271.0 ( 84.8)

1) National Institute of Health and Nutrition in Japan : National nutrition survey, National Institute of Health and Nutrition, (11.1.2002)

Table 4. Blood examination in patients

	N	Mean (SD)	Reference range <sup>1)</sup>
Total protein (g/dl)	59	7.1 ( 0.5)	6.3 — 7.8
Albumin (g/dl)	44	4.3 ( 0.2)	3.7 — 4.9
Blood sugar (mg/dl)	53	127.0 ( 59.9)	2 hours value < 120
HbA1c (%)	23	5.7 ( 1.2)	4.3 — 5.8
Hemoglobin (g/dl)	60	12.1 ( 1.8)	Man 14 — 18 Woman 12 — 16
Total lymphocyte number (/μl)	54	1545.4 (619.4)	≥ 2000

1) Takaku F, Kurokawa K, Kasuga M, et al : LAB DATA test selection and interpretation, Igaku-shoin, Tokyo, 1999

Table 5. Characteristics of the 2 groups

Characteristic		Poor ( n =45)	Good ( n =28)	P value
Gender	Male	34 (75.6)	18 (64.3)	1.000 ‡
	Female	11 (24.4)	10 (35.7)	
Age ( y )	(Mean ± SD)	74.1 ( 7.0)	68.5 (10.9)	0.020 †
Age at operation ( y )	(Mean ± SD)	58.8 ( 7.4)	54.6 (11.1)	0.082 †
Year after surgery ( y )	(Mean ± SD)	15.3 ( 3.0)	13.9 ( 2.7)	0.055 †
Type of reconstruction <sup>a)</sup>	Billroth I	22 (51.2)	19 (67.9)	0.035 ‡
	BillrothII	16 (37.2)	3 (10.7)	
	Substitute stomach (pouch)	4 ( 9.3)	6 (21.4)	
	Jejunal interposition	1 ( 2.3)	0 ( 0.0)	
Lymph node dissection <sup>b)</sup>	≤ R2+ <sup>a</sup>	34 (82.9)	23 (88.5)	0.729 ‡
	R3<	7 (17.1)	3 (11.5)	
No. 16 lymph node dissection <sup>c)</sup>	Yes	7 (17.5)	2 ( 7.7)	0.465 ‡
	No	33 (82.5)	24 (92.3)	
Combined resection of other organs	Yes	8 (17.8)	6 (21.4)	1.000 ‡
	No	37 (82.2)	22 (78.6)	
Diabetes mellitus	Yes	18 (40.0)	11 (39.3)	1.000 ‡
	No	27 (60.0)	17 (60.7)	

† Two sample t test ‡ chi square test

n (%), Mean ± SD

a) n =71 b) n =67 c) n =66

data.

#### 1) Demographic and surgical aspects

Patient demographics in the poor and good nutritional groups are shown in Table 5. Sixty-one point six percent patients were included in the poor nutritional group. When the poor nutrition group was compared with the good nutrition group, there was no difference in age at surgery or years after surgery. There was no significant difference in the male-to-female ratio between the two groups. Mean age was significantly higher in the poor nutrition group: 74.1 (7.0) years compared with 68.5 (10.9) years in the good nutrition group (t=2.418, p=0.020). With respect to reconstruction procedures, in the poor nutrition group, Billroth I was performed in 22 patients (51.2%), Billroth II in 16 patients (37.2%), substitute stomach (pouch) in 4 patients (9.3%), and jejunal interposition in 1 patient (2.3%). In the good nutrition group, Billroth I was performed in 19 patients (67.9%), Billroth II in 3 patients (10.7%), and substitute stomach (pouch) in 6 patients (21.4%). There were significant differences in the percentages of patients who had

undergone reconstruction procedures between the two groups, and in the poor nutrition group, the proportion of patients who had undergone Billroth II was higher than that in the good nutrition group ( $\chi^2=8.581$ ,  $p=0.035$ ). There were no significant differences in extent of lymph node dissection, the presence or absence of concurrent of No. 16 lymph node dissection, and the presence or absence of concurrent (combined) resection of other organs between the two groups. There was no difference in history of diabetes mellitus between the two groups.

#### 2) Physical aspects (Table 6)

There were significant differences in percent body fat and TSF between the two groups: percent body fat was 22.1 (4.7) % in the poor nutrition group and 26.3 (6.2) % in the good nutrition group (t=2.621,  $p=0.012$ ), whereas TSF was 6.8 (3.5) mm in the poor nutrition group and 10.5 (6.9) mm in the good nutrition group (t=2.382,  $p=0.024$ ).

With respect to hematologic data, the hemoglobin level was 11.8 (1.7) g/dl in the poor nutrition group. This value was significantly lower

Table 6. Physical characteristics and nutritional intake of the 2 groups Mean (SD)

Characteristic	Poor (n =45)	Good (n =28)	t value	P value
BMI	19.9 ( 3.0)	20.9 ( 2.6)	1.270	0.210
Percent of body fat (%)	22.1 ( 4.7)	26.3 ( 6.2)	2.621	0.012
TSF (mm)	6.8 ( 3.5)	10.5 ( 6.9)	2.382	0.024
AC (cm)	24.5 ( 2.7)	25.8 ( 2.9)	1.724	0.090
AMC (cm)	22.4 ( 2.6)	22.5 ( 2.2)	0.163	0.871
Number of teeth (number)	13.9 ( 11.7)	15.0 ( 12.5)	0.308	0.760
Bone density (%)	24.4 ( 3.0)	24.3 ( 2.2)	0.091	0.928
Energy (kcal)	1431.3 (391.3)	1503.0 (292.0)	0.874	0.385
Protein (g)	54.0 ( 12.2)	57.5 ( 10.4)	1.228	0.224
Fat (g)	31.3 ( 11.3)	36.6 ( 10.0)	2.001	0.049
Carbohydrate (g)	191.3 ( 62.7)	205.4 ( 45.1)	1.014	0.314
Total protein (g/dl)	7.0 ( 0.47)	7.3 ( 0.36)	1.812	0.076
Albumin (g/dl)	4.2 ( 0.25)	4.3 ( 0.21)	1.239	0.223
Blood sugar (mg/dl)	130.0 ( 67.1)	125.9 ( 49.8)	0.224	0.824
HbA1c (%)	5.7 ( 1.4)	5.7 ( 1.2)	0.132	0.896
Hemoglobin (g/dl)	11.8 ( 1.7)	12.8 ( 1.7)	2.091	0.043
Total lymphocyte number (/μl)	1472.2 (637.8)	1623.2 (585.6)	0.813	0.420

BMI : body mass index ; TSF : triceps skinfold thickness ; AC : mid-arm circumference ; AMC : arm muscle circumference

than 12.8 (1.7) g/dl in the good nutrition group (t=2.091, p=0.043) and was below the reference range. Blood sugar levels increased in both groups, although there were no significant differences between groups.

### 3) Aspects of nutritional intake (Table 6)

According to the dietary questionnaire, energy intake, protein intake, and carbohydrate intake were slightly lower in the poor nutrition group compared with the good nutrition group, although there were no significant differences between groups. Lipid intake was 31.3 (11.3) g in the poor nutrition group and 36.6 (10.0) g in the good nutrition group (t=2.001, p=0.049).

### 4) Lifestyle-related and psychological aspects (Table 7)

There was no significant difference in performance status between two groups. In the poor nutrition group, 68.2% of patients reported that staple food intake was low, and the percentage of patients reported that staple food intake was low was significantly higher ( $\chi^2=5.856$ , p=0.027). There were no significant differences between

groups in appetite, staple food form, side dish intake, diarrhea frequency, VAS, and life satisfaction index.

## DISCUSSION

In this study, we found that : 40.5% of patients had diabetes mellitus, and 61.6% of the long-term survivors after partial gastrectomy belonged to the poor nutritional group in whom the rate of weight loss was  $\geq 10\%$ . Moreover, type of reconstruction, age, percent body fat, TSF, lipid intake, hemoglobin levels, and the staple food intake were significantly different between the poor nutrition group and the good nutrition group.

In remarkably, diabetes mellitus was observed in 40.5% of patients of the long-term survivors after partial gastrectomy in this study. Despite the small number of subjects, 30 of 74 patients (40.5%) developed diabetes after surgery (Table 1). However, in this study, resection of the pancreas was not performed. Another report showed impaired glucose tolerance after a distal and to-

Table 7. Lifestyle-related and psychological characteristics of the 2 groups Mean (SD)

Characteristic		Poor (n = 45)	Good (n = 28)	P value
Performance status	Self-support	39 (88.6)	25 (96.2)	0.401 ‡
	Need of care	5 (11.4)	1 (3.8)	
Appetite	Yes	39 (88.6)	27 (96.4)	0.394 ‡
	No	5 (11.4)	1 (3.6)	
Staple food intake	> Normal	14 (31.8)	17 (60.7)	0.027 ‡
	Low	30 (68.2)	11 (39.3)	
Staple food form	> Normal	29 (65.9)	19 (67.9)	1.000 ‡
	Soft	15 (34.1)	9 (32.1)	
Side dish intake	> Normal	25 (56.8)	20 (74.1)	0.205 ‡
	Low	19 (43.2)	7 (25.9)	
Diarrhea frequency	Yes	9 (20.5)	3 (11.1)	0.352 ‡
	No	35 (79.5)	24 (88.9)	
VAS	Health status	6.4 (2.4)	6.5 (2.4)	0.853 †
	Nutritional status	6.1 (2.5)	6.2 (2.3)	0.863 †
Life satisfaction index	Total Score	20.0 (3.5)	20.0 (3.8)	0.989 †
	Health functioning	19.1 (3.8)	19.7 (4.6)	0.596 †
	Socioeconomic	20.2 (3.6)	19.5 (3.2)	0.454 †
	Psychological/spiritual	20.5 (4.1)	20.3 (4.3)	0.881 †
	Family	21.9 (4.8)	21.8 (4.3)	0.943 †

† Two sample t test ‡ chi square test  
n (%), Mean ± SD, VAS : visual analog score

tal gastrectomy<sup>21</sup>). Compared with a survey of the Ministry of Health, Labour and Welfare (2002) regarding diabetes mellitus<sup>22</sup>, the incidence of diabetes mellitus in patients who had undergone partial gastrectomy in this study was higher than Japanese elderly over 70 years old (men: 37.4%, women: 28.3%). However, the mechanism and incidence of diabetes after partial gastrectomy have not been elucidated. Regardless, diabetes mellitus is an important issue in nutritional management, and patients who have undergone a partial gastrectomy should be tested for diabetes for the long term.

We found that ratio of the poor nutritional group was high with weight loss of no less than 10%. It was also reported that weight reduction persists for 5 years after partial gastrectomy<sup>23</sup>. Weight loss of 61.6% of our patients after partial gastrectomy had not been recovered for longer than 10 years. These results differ from another study in which a cumulative increase in body weight was seen 10 years after surgery<sup>24</sup>. The reason for this discrepancy is not clear, although

several hypotheses exist. For example, it has been suggested that although patients who undergo a partial gastrectomy have good appetite and sufficient food intake, this is not always reflected in their weight. We consider that the reason for this may be that late weight loss more than 4-5 years after surgery is frequently caused not by reduced energy intake but by digestive and absorptive disturbances. Particularly, Billroth's procedure II was performed significantly more often in the poor nutrition group than the good nutrition group. Billroth II is considered as a non-physiological procedure. Therefore, the following mechanism is speculated in patients who have undergone a partial gastrectomy in regard to digestion/absorption of fat: food is rapidly excreted to the small intestine, and thus does not have the chance to mix with digestive juices, making food digestion incomplete. In particular, fat micelle formation is impaired, causing a fat absorption disorder<sup>25</sup>. In these reason, we believe that actual fat intake, percent body fat, and TSF in the poor nutrition

group was significantly lower.

Hemoglobin levels in the poor nutrition group were lower than the reference range, and many patients experienced anemia. In a report by Onda et al<sup>14</sup>, 79% of 3-year survivors who underwent a partial gastrectomy experienced anemia. Our findings of anemia among patients more than 10 years after surgery are similar to that study. Patients who undergo partial gastrectomy should be monitored for anemia over the long term. In this study, total lymphocyte count was below 1500/ $\mu$ l in the poor nutrition group. It is possible that this group lead to reduced immunity. In addition, participants in this study were older.

In this study, 85% of patients overall had a good appetite. Furthermore, carbohydrate intake related to the staple food did not differ between groups. However 68.2% of patients in the poor nutrition group had reported that they ingested a low amount of staple foods. The reason why they ate a small amount of food despite reporting a good appetite is unclear. It is said that meal satisfaction is produced from eating a sufficient amount of favorite things<sup>26</sup>). After a gastrectomy, expectations may be high and meal satisfaction may be difficult to achieve. Thus, based on the reduction in digestion and absorption, patients need to be advised about potential limitations in their ability to be completely satisfied after a meal. Support from family and friends, alternative cooking styles, and new recipes may improve meal satisfaction.

Throughout this study, age was different between two groups. Age may influence the other variables. In the future, we need to estimate relationship between age and other variables.

For nurses, lipid intake is the only factor contributing to weight loss after partial gastrectomy that can be controlled. Because massive ingestion of lipids is not recommended, it can be difficult to increase lipid intake. When patients experience marked weight loss, they should receive supplements with other nutrients to replace the lipids. In addition, new type/methods of lipid ingestion must be developed.

This study has several limitations. The sample size of this study was relatively small. The pos-

sibility of recall bias was not fully ruled out. There were multiple omissions in the answers of the questionnaire. The participants were recruited from only the two hospitals where the surgical strategy was determined by the similar particular protocol. These factors may make it difficult to generalize the results of this study for all of long-term survivors after partial gastrectomy. In the future, the background and life status of patients with abnormal values for each item assessed should be serially investigated in detail. In particular, postoperative development of diabetes mellitus should be prospectively investigated.

## CONCLUSION

We investigated long-term survivors who underwent a partial gastrectomy  $\geq 10$  years previously and examined factors related to nutritional status.

1. Long-term survivors after partial gastrectomy had lower in percent body fat and TSF than the reference ranges. Furthermore, 61.6% of long-term survivors lost  $\geq 10\%$  of their body weight after partial gastrectomy, placing them in the poor nutrition group.

2. The incidence of diabetes mellitus after gastrectomy was high.

3. Type of reconstruction, age, percent body fat, TSF, lipid intake, hemoglobin levels, and the staple food intake were significantly difference between the poor nutrition group and the good nutrition group.

4. Nursing points related to the form and method of lipid intake are important among long-term survivors after partial gastrectomy.

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## CONFLICT OF INTEREST

The authors declare that they have no conflict



of interest.

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## 胃部分切除後長期生存者の栄養状態に関する実態調査

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### キーワード

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### 要 旨

目的：本邦では胃癌において、術後症状の重症度から全摘に焦点を絞った研究が多い。そのため、胃部分切除後長期経過した患者の栄養状態とそれを取り巻く包括的な要因は不明である。本研究では、胃部分切除後長期生存者の栄養状態の実態を明らかにし、必要な看護ケアの示唆を得ることを目的とした。

方法：対象は、胃部分切除術を受け10年以上経過した86名であった（回収率90.7%）。身体計測と血液検査、アンケート調査を実施し、栄養状態別に比較をおこない、栄養状態に影響を及ぼす要因を抽出した。

結果：40.5%の患者が糖尿病を罹患するとともに、61%の患者が術後10年以上を経過しても10%以上の体重減少が継続していた。これら栄養状態不良群では再建方法・年齢・体脂肪率・皮脂厚・脂肪の摂取量・ヘモグロビン値・主食の量において栄養状態良好群と比較して有意差を認めた。以上の結果より、胃部分切除者の術後の看護介入として、特に脂質の摂取方法の工夫が必要であることが示唆された。