

Case of Survival Without Intravenous Nutritional Support in an Adult with Short Bowel Syndrome

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ABSTRACT

We report a case of survival in the absence of intravenous nutritional support in an adult patient with short bowel syndrome, despite the very short length of the small and large intestine.

Short bowel syndrome is defined as malabsorption resulting from anatomical or functional loss of the small intestine. The case is a 59-year-old woman who underwent resection of nearly her entire large intestine in response to Gardner Syndrome (familial polyposis) about 34 years previously at another hospital. About 30 years ago, at our hospital, she underwent a massive intestinal resection because of a mesenteric tumor. About 10 years ago, at our hospital, she underwent residual rectum about 12cm due to rectal cancer. The length of her residual small intestine and large intestine was ultimately 50cm length and 13cm length, respectively. From our experience, we emphasize that there are some cases of short bowel patients who do not require intravenous nutritional support and who can maintain themselves on enteral feedings.

Key words : short bowel syndrome, total parenteral nutrition(TPN)

INTRODUCTION

Short bowel syndrome in adults is defined as malabsorption resulting from anatomical or functional loss of a significant length of the small intestine. Usually the length of the

residual small intestine is less than 150 cm¹⁾. Short bowel syndrome in adults can be caused by a variety of conditions, most of which are the result of vascular or ischemic insults. Adults commonly experience short bowel syndrome due to trauma, thrombosis, embolism of the mesenteric vessels, inflammatory

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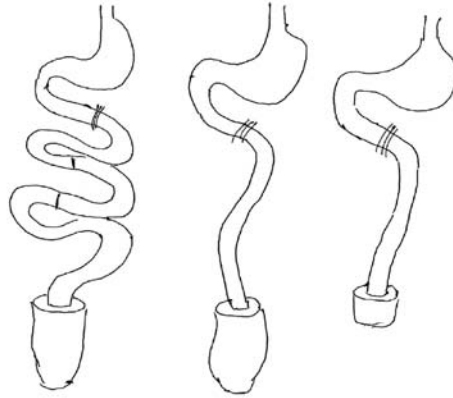


Table 1. The schema of the patients' small and large intestine, historical changes.

	1979.2.2~	1981.9.11~	2000.7.12~
small intestine	140cm	55cm	50cm
large intestine	25cm	25cm	13cm
disease	mesenteric tumor	recurrence of mesenteric tumor	rectal cancer

bowel disease, a volvulus, radiation enteritis, or other causes²⁾. Usually such patients are maintained on long-term TPN or, more frequently, are considered for intestinal transplantation.

CASE REPORT

We recently treated a 59-year-old woman with a residual small intestine length of about 50 cm, who has gone without any intravenous nutritional support for nine years. On April 30, 1975, at another hospital her large intestine was reduced by about 13 cm in length to treat Gardner Syndrome (familial polyposis). On February 2, 1979, at our hospital a mesenteric tumor was removed and on July 12, 2000, at our hospital she was treated for rectal cancer (Table 1). She was admitted to our hospital to remove a residual rectal polyp on November

21, 2008. The pathological outcome of the polyp was adenoma, a low-grade malignancy, and not cancer.

She was diagnosed with short bowel syndrome. Such patients usually require permanent parenteral nutrition (PN) to maintain their nutritional status. This patient, however, did not require PN and was discharged well on December 1, 2008.

The length of her rectum was about 13 cm, due to a partial resection to treat rectal cancer on July 12, 2000. After this operation, her small intestine was about 50 cm (not including the duodenum) and her large intestine was about 13 cm. She did not require intravenous nutritional support and she has maintained herself on enteral feedings for the nine years that have passed since the resection.

She was 150 cm in height and 49.2 kg in body weight on the day of admission,

small intestine is 50 cm in leng, large intestine is 13 cm in leng

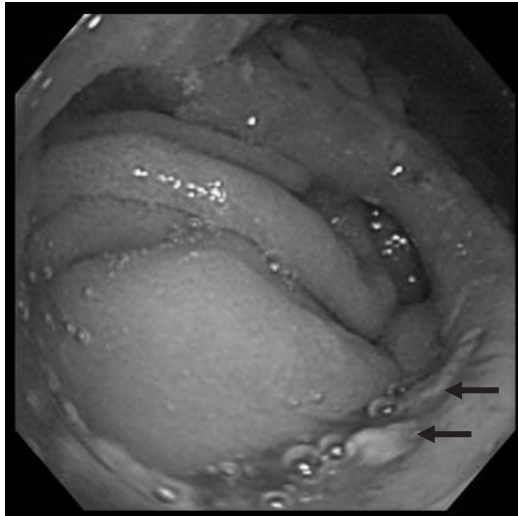


Fig. 1. Colonofiber endoscopy of the small intestinal mucosa inside of the anastomosis. The mucosa of the small intestine appeared to be normal. There are some ulcerations on anastomosis (arrow).

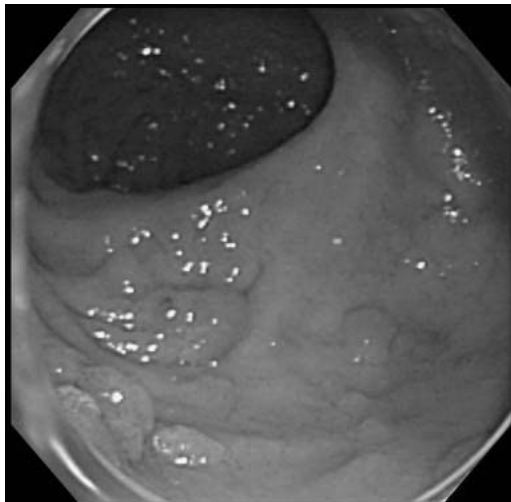


Fig. 2. Colonofiber endoscopy of the residual rectal mucosa outside of the anastomosis. Many polyps were observed on the remaining rectal mucosa.

November 21, 2008. She underwent surgery to remove the polyp on November 26, 2008 and she was discharged on November 30, 2008.

Pre-operative laboratory data were suitable to justify discharge: Her T.P. was 7.0g/dl and

Alb was 4.3 g/dl. She had slight anemia, evidenced by an Hb level of 11.9 g/dl and an Ht of 35.7%. Post-operative laboratory data were favorable as well (Table 2).

She was fed rice gruel in our hospital, and

Table 2. Laboratory data of the patient

	Pre-operative	post-operative
T.P (g/dl)	7.0	6.7
Alb (g/dl)	4.3	4.0
ChE (IU)	438	431
AST (IU)	21	24
ALT (IU)	20	21
ALP (IU)	171	170
T-Bil (mg/dl)	0.7	1.6
Na (mEq/l)	142	141
K (mEq/l)	3.9	3.7
Cl (mEq/l)	106	105
WBC (103/ μ l)	6550	8260
RBC (106/ μ l)	366	366
Hb (g/dl)	11.9	11.9
Ht (%)	35.7	35.5
Plt (10 ³ / μ l)	38	38.8

she completed each meal offered to her. Rice gruel supplies 1600 kcal per day. The rice gruel consisted of 62.5% carbohydrate, 15% protein, and 22.5% fat. She defecated from 8 to 14 times per day. Defecations were nearly all loose stools. This was the reason why her condition was classified as malabsorptional status. We diagnosed the patient with short bowel syndrome.

Colonoscopic results are shown in Figs. 1 and 2. Roughly one year (November 10, 2009) after the removal of the rectal polyp, the mucosa of the small intestine appeared to be normal. However, there were many polyps in the remaining rectal mucosa (Fig. 2).

DISCUSSION

Short bowel syndrome in adults is defined as malabsorption resulting from anatomical or functional loss of a significant length of the small intestine. The usual length of the residual small intestine is less than 150 cm¹⁾. Enteral nutrition is superior to parenteral nutrition for improving nutritional status and immune function³⁾. Francisca et al.⁴⁾ showed that continuous tube feeding is useful in cases of gastric and small intestinal motor disturbances related to short bowel syndrome, and clearly improves intestinal absorption. Recent studies have shown that enteral nutrition during periods of stress preserve intestinal absorption.

PN is no longer absolutely necessary for the survival of short bowel syndrome patients. Bernald et al.¹⁾ demonstrated that survival of these patients was negatively related to enterostomy, to a bowel length of less than 50 cm, and to arterial infarction as a cause for bowel resection. Survival was not improved by the use of PN.

Regarding the PN dependence of short bowel syndrome patients, Nightingale et al.⁵⁾ observed an intestinal response to food and drink if the jejunal length was less than 100 cm. They emphasized that accurate measurements of the intestinal response to food and drink might help to identify those patients who require parenteral supplements.

Wasa et al.⁶⁾ showed that additional therapeutic agents might be required in adult patients with a residual bowel length of less than 50 cm in order to allow weaning from TPN. In their article, the minimum residual length of the small intestine in adult patients who were

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successfully weaned from TPN was 57 cm. These patients had not undergone operations on their large intestine. Wilmore et al⁷ showed in their article that 50% of TPN-dependent short bowel patients whose length of the small intestine was less than 50cm, could be weaned off the TPN if their large intestine remained intact⁷.

The woman reported in our case has maintained self-administered enteral feeding. This is extremely rare in cases of short bowel syndrome. Our patient had undergone surgery on her large intestine due to Gardner Syndrome about 34 years previously. At that time, the residual length of her small intestine was about 140 cm and the residual length of her large intestine was about 25 cm. Later, on September 11 1981, she underwent small intestine resection due to the recurrence of a mesenteric tumor. On July 7, 2000, her residual rectum was resected by about 12 cm due to rectal cancer, which pathological examination determined to be a submucosal invasion of adenocarcinoma. After this operation, the length of her residual small intestine was about 50 cm and the length of her residual large intestine was about 13 cm (Table 1).

Her ability to maintain her nutritional status solely through enteral feeding, without PN support, was due to the fact that her digestion and absorption abilities were similar to those of normal patients. We speculate that her residual small intestine had compensated for the loss of bowel length during the 30 years since the resection surgery. With bowel compensation, absorption of enteral nutrients is gradually enhanced, while diarrhea and malabsorption decrease⁸. Byrne et al.⁸ showed that a high-carbohydrate, low-fat diet, administration of the amino acid glutamine, and the

administration of growth hormone reduced TPN requirements for short bowel patients⁸. By using these combined therapies, the researchers showed that 40% of TPN-dependent short bowel patients could be weaned from TPN, and that an additional 40% showed a reduction in their TPN requirements. Mutoh et al⁹ showed in their article that the overall prevalence of hyperlipidemia in FAP cases was 58%. This might be one of the reasons why our case was able to survive without requiring intravenous nutritional support, although the lengths of her small and large intestine were very short.

It is possible that our patient had consumed a high-carbohydrate, low-fat diet for these past 30 years.

From our experience, we emphasize that there are some cases of short bowel patients who do not require intravenous nutritional support and who are able to maintain themselves on enteral feedings. Therefore, we should tend carefully to these short bowel patients as they may be able to wean off TPN in the future.

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