



Long-Term Outcome of Home Parenteral Nutrition in Patients with Short Bowel Syndrome: A Case Report

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Abstract

Introduction: Short bowel syndrome can cause severe malnutrition. Parenteral nutrition and the prescription of water and electrolyte can increase the survival of these patients. This article introduces a patient, who received parenteral nutrition for nine months after gastric cancer surgery and chemotherapy because of the initiation of cutaneous fistula (short bowel syndrome).

Case Presentation: The patient was a 33-year-old male, who had undergone total gastrectomy due to gastric adenocarcinoma. After chemotherapy, because of the peritonitis, laparotomy was performed; the abdomen was full of fecal and bile liquid, and the perforation area was not found due to the high adhesion in the abdomen. Considering the continued secretion from the right drain area of the abdomen, with the possibility of spontaneous closure, TPN was performed for nine months. Fistula repair surgery was done and postoperative total parenteral nutrition was terminated in nine days and oral feeding was started and the patient was discharged in good condition.

Conclusions: Total home parenteral nutrition (HPN) in patients with short bowel syndrome increases the survival of patients without dangerous side effects. Home parenteral nutrition can be useful to prepare the patient for surgery.

Keywords: Short Bowel Syndrome, Home Parental Nutrition, Gastric Cancer

1. Introduction

Short bowel syndrome can cause severe malnutrition. Parenteral nutrition and the prescription of water and electrolyte can increase the survival of these patients.

In parenteral nutrition, carbohydrates and intralipid were used to provide calories. To prevent unwanted reactions (hyperglycemia), the diet was first started with lower caloric content (1).

Daily protein requirements (1 gr/kg/d), amino acid solution, were administered intravenously. Lipid emulsions (30% of calories) were long-chain triglycerides (2, 3).

Additives include electrolytes, vitamins and trace elements. Electrolyte additives include sodium chloride, magnesium, potassium, phosphorus and calcium. Vitamin products are added to all patients receiving TPN. Trace elements include chromium, copper, iodine, iron, manganese and zinc, added to the TPN solution (4, 5).

In TPN, calories with fluid were given daily. Then the required electrolytes, vitamins and trace elements were added (2).

Although long-term home parenteral nutrition (HPN) can increase the survival rates of these patients, yet it is accompanied with the catheter-related complications including hematoma, bleeding, pneumothorax, thrombosis and infection (2, 6).

Other complications include hyperglycemia, hypophosphatemia, hypokalemia, hypomagnesaemia, hypercapnia, mucosal atrophy, cholecystitis, and increased liver enzymes (1, 4, 7).

Biochemical tests, liver tests and complete blood count were initially done once a week and then twice a month (2, 3).

Home parenteral nutrition was administered for 12 hours during the night and tapered in the morning for two hours (2). Adequate control of water and electrolyte is not possible by tests. The caretakers became informed about the status of electrolyte water by asking the patient in terms of thirst, weakness and fatigue, swelling of limbs and amount of urine, and measuring heart rate and blood pressure (3).

In Iran, there are a few studies about home parenteral

nutrition. This article introduces a patient, who received parenteral nutrition for nine months after gastric cancer surgery and chemotherapy because of the initiation of cutaneous fistula.

2. Case Presentation

The patient was a 33-year-old male that had undergone total gastrectomy due to gastric adenocarcinoma. Two weeks after surgery, chemotherapy was started. On the fifth day of chemotherapy, the patient had severe abdominal pain, nausea and vomiting.

Because of the peritonitis, laparotomy was performed. During the surgery, the abdomen was full of fecal and bile liquid and the perforation area were not found due to the high adhesion in the abdomen. For the patient, three corrugated drains (one on the left and two on the right) were implanted.

Despite the release of food from drains with the possibility of spontaneous closure of the perforation, the patient was discharged after 23 days of hospitalization.

The patient was hospitalized again after a week of discharge due to severe weakness, fatigue and cachexia, and TPN was started. During two months of TPN, the patient was diagnosed with pulmonary embolism that was treated with heparin.

During hospitalization, the patient had tearing and blurred vision (fungal retinitis) and was treated with non-liposomal amphotericin for 14 days. Treatment was continued with fluconazole, and in spite of temporary recovery, the symptoms were relapsed and treated again with amphotericin and then fully recovered. Two months later, the patient was discharged from the hospital and underwent home parenteral nutrition. Home parenteral nutrition instructions were trained to nurse and performed at home. Initially, tests were performed once a week and then twice a month.

One week after discharge, the patient had pelvic pain, followed by dyspnea, and DVT was diagnosed with Doppler Ultrasound and the patient was treated with enoxaparin.

Two months later, the patient had seizures, hemiplegia and urinary incontinence that were suspected as metastasis while the brain magnetic resonance imaging (MRI) was normal and symptoms were controlled with a high dose of intravenous meperidine (800 mg). Alkaline phosphatase enzyme was increased, and reduced to normal levels by decreasing intralipid to 500 mL a week. Changes in potassium, sodium, magnesium, phosphorus, increased urea and creatinine occurred.

After six months due to the remaining fistula, fistulography was performed (Figure 1).



Figure 1. Remaining Fistula in the Fistulography

Fistula of the patient still remained after eight months since the operation. The patient was hospitalized to close the fistula. The preoperative vital signs were as follows; blood pressure (BP): 100/70 mmHg, PR: 90/min, RR: 16/min, T: 37°C.

The conjunctiva was pale in the examinations. There was no lymphadenopathy, and the heart and lungs were normal. The abdomen was soft, no tenderness and guarding; there was a fistula parallel to the umbilical cord, 5 cm to the right side, that contained fecaloid secretions. Chest X-ray (CXR) and electrocardiogram (ECG) were normal.

Preoperative laboratory data were hemoglobin (HB): 9.5 gr/dL, hematocrit (HCT): 29.9%, white blood count (WBC): 15100, platelet (Plt): 404000, prothrombin time (PT): 12, INR: 1, partial thromboplastin time (PTT): 32, blood urea nitrogen (BUN): 8, Cr: 0.6, sodium (Na): 136, potassium (K): 4.6, calcium (Ca): 8.6, phosphate (P): 3.8, albumin (Alb): 3.2.

The laparotomy was performed under general anesthesia and bowel resection of the fistula; primary repair and heterolysis were performed.

On the fifth day after surgery, oral feeding was well tolerated. Nine days after surgery parenteral nutrition was discontinued. Finally, after 17 days of hospitalization, the patient was discharged with good general condition.

3. Discussion

This article introduced a patient, who underwent total parenteral nutrition for seven months at home due to cutaneous fistula. In this patient HPN had important complications including retinitis candidate, deep vein thrombosis, seizures, and electrolyte abnormalities.

Lago Rivero et al. introduced a patient, who underwent TPN for 10 months (7.5 months at home) due to cutaneous fistula. In the long term parenteral nutrition, the patients had no life-threatening serious complications (8). In the present case, however, the electrolyte disorder, fungal retinitis and thromboembolism had occurred but the patient responded to treatments.

Mundi et al. in a study entitled "use of home parenteral nutrition in post-bariatric surgery-related malnutrition" concluded that HPN could be useful to prepare the patient for surgery (9). This finding is similar to our patient, who was prepared for surgery by HPN.

Girke et al. in a study that assessed the quality of life of 49 end stage cancer patients under HPN came to the conclusion that this method was useful to improve the quality of life of these patients without having dangerous effects (10).

Abi Nader et al. studied 251 patients under HPN and concluded that SBS was the most common reason for having HPN. Home parenteral nutrition without serious complications is useful to improve the outcome of patients. The main cause of death in these patients was underlying diseases (11).

Theilla et al. in a study that evaluated the safety of HPN in pregnant women concluded that lipid base HPN is safe for pregnant women (12).

In our patient, hyponatremia, hypokalemia and hypomagnesaemia had occurred in a period of nine months. Alkaline phosphatase enzyme was increased and reduced to normal levels by decreasing intralipid to 500 mL a week.

3.1. Conclusions

Total home parenteral nutrition in patients with short bowel syndrome increases the survival of patients without dangerous side effects. Home parenteral nutrition can be useful to prepare the patient for surgery.

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Footnotes

Authors' Contribution: Study concept and design: Parviz Amri Maleh; acquisition of data: Parviz Amri Maleh, Seyed Reza Modarres and Hossein Emami; analysis and interpretation of data: Parviz Amri Maleh; drafting of the manuscript: Parviz Amri Maleh; critical revision of the manuscript for important intellectual content: Parviz Amri Maleh, Seyed Reza Modarres and Hossein Emami; statistical analysis: Parviz Amri Maleh, Seyed Reza Modarres and Hossein Emami; Administrative, technical and material support: Parviz Amri Maleh; study supervision: Parviz Amri Maleh.

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References

- Pironi L. Definitions of intestinal failure and the short bowel syndrome. *Best Pract Res Clin Gastroenterol.* 2016;**30**(2):173-85. doi: [10.1016/j.bpg.2016.02.011](https://doi.org/10.1016/j.bpg.2016.02.011). [PubMed: 27086884].
- DeLegge MH, Ireton-Jones C. *The ASPEN nutrition support core curriculum: a case-based approach-the adult patient.* Home Care. In: Guenter P, editor. 1. USA: American Society for Parenteral and Enteral Nutrition; 2007.
- Theresa AF. Optimizing Care in Home Parenteral Nutrition The RD's Role. *Today's Diet.* 2011;**13**(7):38.
- Dibb M, Teubner A, Theis V, Shaffer J, Lal S. Review article: the management of long-term parenteral nutrition. *Aliment Pharmacol Ther.* 2013;**37**(6):587-603. doi: [10.1111/apt.12209](https://doi.org/10.1111/apt.12209). [PubMed: 23331163].
- Plogsted S, Adams SC, Allen K, Breen HB, Cober MP, Greaves J, et al. Parenteral Nutrition Electrolyte and Mineral Product Shortage Considerations. *Nutr Clin Pract.* 2016;**31**(1):132-4. doi: [10.1177/0884533615621550](https://doi.org/10.1177/0884533615621550). [PubMed: 26703958].
- Dibb MJ, Abraham A, Chadwick PR, Shaffer JL, Teubner A, Carlson GL, et al. Central Venous Catheter Salvage in Home Parenteral Nutrition Catheter-Related Bloodstream Infections: Long-Term Safety and Efficacy Data. *JPEN J Parenter Enteral Nutr.* 2016;**40**(5):699-704. doi: [10.1177/0148607114549999](https://doi.org/10.1177/0148607114549999). [PubMed: 25224728].
- Wanten GJ. Parenteral approaches in malabsorption: Home parenteral nutrition. *Best Pract Res Clin Gastroenterol.* 2016;**30**(2):309-18. doi: [10.1016/j.bpg.2016.03.010](https://doi.org/10.1016/j.bpg.2016.03.010). [PubMed: 27086893].
- Lago Rivero N, Mucientes Molina A, Paradela Carreiro A, Vazquez Gomez C, Arias Santos I, Gonzalez Costas S, et al. [Home parenteral nutrition in Crohn's Disease patient: a case report]. *Nutr Hosp.* 2012;**27**(5):1655-7. doi: [10.3305/nh.2012.27.5.5884](https://doi.org/10.3305/nh.2012.27.5.5884). [PubMed: 23478720].
- Mundi MS, Vallumsetla N, Davidson JB, McMahon MT, Bonnes SL, Hurt RT. Use of Home Parenteral Nutrition in Post-Bariatric Surgery-Related Malnutrition. *JPEN J Parenter Enteral Nutr.* 2016. doi: [10.1177/0148607116649222](https://doi.org/10.1177/0148607116649222). [PubMed: 27208038].
- Girke J, Seipt C, Markowski A, Luettig B, Schettler A, Momma M, et al. Quality of Life and Nutrition Condition of Patients Improve Under Home Parenteral Nutrition: An Exploratory Study. *Nutr Clin Pract.* 2016. doi: [10.1177/0884533616637949](https://doi.org/10.1177/0884533616637949). [PubMed: 27165116].
- Abi Nader E, Lambe C, Talbotec C, Pigneur B, Lacaille F, Garnier-Lengline H, et al. Outcome of home parenteral nutrition in 251 children over a 14-y period: report of a single center. *Am J Clin Nutr.* 2016;**103**(5):1327-36. doi: [10.3945/ajcn.115.121756](https://doi.org/10.3945/ajcn.115.121756). [PubMed: 27030532].
- Theilla M, Lawinski M, Cohen J, Hadar E, Kagan I, Perkewick M, et al. Safety of home parenteral nutrition during pregnancy. *Clin Nutr.* 2015. doi: [10.1016/j.clnu.2015.12.001](https://doi.org/10.1016/j.clnu.2015.12.001). [PubMed: 26708728].