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Short communication

Parenteral nutrition in short bowel syndrome – case report

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Introduction

Short bowel syndrome (SBS) is a severe form of intestinal failure resulting from extensive surgical resection, congenital defects, or disease-related loss of absorptive intestinal surface. It is characterized by the inability to maintain adequate nutritional, fluid, electrolyte, and micronutrient balance through conventional oral intake alone, frequently necessitating long-term parenteral nutrition support (O'Keefe et al., 2006). Total Parenteral Nutrition (TPN) is a lifesaving, intravenous intervention for severe SBS that delivers vital carbohydrates, proteins, fats, vitamins, and minerals directly into the bloodstream. It bypasses the compromised gastrointestinal tract, preventing malnutrition and allowing for the fluid and electrolyte stabilization of the patient. Even with risks and complications, provides several essential functions: *Life-Sustaining Nutrition* - provides the macronutrients and micronutrients necessary for basic survival, especially when a patient's remaining bowel is too short. *Fluid & Electrolyte Balance* - compensates for severe dehydration and electrolyte imbalances associated with high-output stomas and rapid intestinal transit. *Intestinal Adaptation Support:* while patient relies on TPN, concurrent enteral or oral nutrition is often introduced—even in tiny amounts—to trigger the release of trophic hormones and stimulate bowel adaptation, the process where the remaining gut increases its absorptive capacity (Cuerda et al., 2021; Bielawska and Allard, 2017). To minimize the complications and risks, patient should be carefully monitored by a multidisciplinary nutrition support team.

Case presentation

A 38-year-old male patient was admitted with severe intestinal failure following extensive gastrointestinal surgery. The patient underwent enterectomy and colectomy due to Grade II liposarcoma, accompanied by gastrostomy and duodenostomy formation. A previous cholecystectomy had been performed. Following surgery, the patient developed severe SBS with high-output gastrointestinal losses, profound malabsorption, dehydration, electrolyte disturbances, and dependence on TPN. According to current definitions, patient fulfilled criteria for chronic type III intestinal failure requiring long-term intravenous nutritional support (Pironi et al., 2014).

Nutritional management consisted of individualized TPN administered through a central venous catheter and subsequently continued as Home Parenteral Nutrition. Daily monitoring included assessment of gastrointestinal output and urine volume, while laboratory parameters were evaluated weekly. Follow-up imaging with computed tomography of the abdomen and thorax was performed every six months. During treatment, the patient experienced significant metabolic complications commonly associated with SBS. Initial laboratory findings demonstrated renal

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impairment with elevated serum urea and creatinine, together with hypokalemia and hypomagnesemia. Progressive improvement in renal function was observed following optimization of hydration and parenteral support. Body weight remained relatively stable throughout follow-up. Biochemical monitoring also revealed transient liver dysfunction with elevated alkaline phosphatase, aminotransferases, and gamma-glutamyl transferase, findings consistent with intestinal failure-associated liver disease, a recognized complication of long-term PN (Howard and Hassan, 1998). Ultrasonography demonstrated hepatic steatosis, while no renal calculi were detected. The patient required two hospitalizations during the eight-month treatment period. Despite nutritional stabilization and careful monitoring, he developed severe pneumonia. The cause of death was respiratory complications secondary to pneumonia.

Discussion

Successful management of SBS depends on maximizing intestinal adaptation, optimizing fluid and electrolyte balance, preventing nutrient deficiencies, and minimizing complications related to long-term PN (Buchman, 2004; Jeejeebhoy, 2012). In the present case, extensive bowel resection resulted in irreversible intestinal insufficiency, making long-term TPN the only viable therapeutic option. TPN enabled maintenance of body weight and partial correction of metabolic abnormalities, demonstrating its essential role in sustaining patients with severe SBS. However, prolonged PN is associated with complications including catheter-related infections, thrombosis, and liver disease, all of which contribute significantly to mortality (Howard and Hassan, 1998; Amiot et al., 2013). Patient's fatal outcome was related to severe pulmonary infection rather than nutritional failure itself. Similar observations have been reported in studies of patients receiving long-term PN, where mortality frequently results from underlying disease processes or infectious complications rather than from SBS directly (Amiot et al., 2013).

Conclusion

This case demonstrates the complexity of managing severe SBS-associated chronic intestinal failure. Parenteral nutrition remains a life-sustaining therapy for patients with insufficient intestinal absorptive capacity and can provide metabolic stabilization and acceptable nutritional status. Nevertheless, long-term outcomes remain strongly influenced by infectious complications and the underlying disease. Multidisciplinary monitoring, early recognition of complications, and individualized nutritional support are essential for improving patient outcomes.

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