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Case Report

Short Bowel Syndrome and Use of Negative Pressure Therapy in a Male Adolescent

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Abstract

Extensive intestinal resection can cause intestinal failure with an impact on nutrient absorption. The severity of the condition depends on the extent and location of the resection, as well as the underlying disease. In this case, a 16-year-old adolescent who, following multiple abdominal surgeries and ischemic bowel loss, developed short bowel syndrome, requiring parenteral nutrition and prolonged use of negative pressure therapy for the management of postoperative complications. Through a multidisciplinary approach, progressive intestinal adaptation was achieved, allowing the transition to enteral feeding and improving his nutritional status.

Keywords: *Short Bowel Syndrome; Negative Pressure Therapy; Male Adolescent*

Introduction

Short bowel syndrome is a condition characterized by the insufficiency of the length of the intestine due to physical loss by surgical resection of the same or loss of the function of a portion of the small and/or large intestine, which compromises the capacity to absorb nutrients such as fats, carbohydrates (sugars), vitamins, minerals, trace elements and liquids (malabsorption). In pediatric age, short bowel syndrome is due to congenital malformations, significant surgery to resect the small intestine or absorption loss associated with the disease. It is the main cause of intestinal failure in children.

Due to these anatomical and metabolic changes, short bowel syndrome is a complex entity that entails a series of complications, among which difficulties in wound healing stand out. The skin, like the intestine, is a dynamic organ that requires an adequate environment for tissue repair. In this sense, negative pressure systems currently represent a promising therapeutic option to improve wound healing in patients with short bowel syndrome. (1-8)

Case Presentation

A 16-year-old male adolescent with a surgical history of appendicular starting point peritonitis in August 2022, treated extra-institutionally, which required 4 days of hospitalization. One month later, in September 2022, the patient underwent surgery for intestinal obstruction secondary to bands and adhesions. During the postoperative period, he presented intestinal perforation, so he was taken to surgery again, where intestinal resection and anastomosis were performed, requiring 1 month of hospitalization.

As a result of his last intervention, he presented contained eventration of the wound and in) October 2023, he required a new surgical intervention, which required a day of hospitalization.

In March 2024, Mother reports the onset of her current illness 6 hours prior to her admission characterized by presenting diffuse abdominal pain of mild to moderate intensity, colic type, without extenuating circumstances, concomitant 5 episodes of food content and absence of bowel movements in 48 hours so she goes to this center where she is evaluated and a decision is made for her admission. On admission, the patient presented a picture of partial intestinal obstruction that rapidly evolved into hemodynamic instability, with tachycardia, peripheral hypotension, concomitant multiple coldness and cyanosis, and episodes of bilious vomiting. The abdomen was distended, painful on superficial and deep palpation, with clear signs of peritoneal irritation and absence of bowel sounds. An abdominal X-ray was performed, showing clear signs of intestinal obstruction, and the patient was rushed to the operating room. Intraoperative findings (1st intervention)

During the surgical intervention the following findings were found:

1. A wine-like, foul-smelling liquid in the abdominal cavity, approximately 600 cc, suggestive of intestinal distress.
2. A 5 x 6 cm mesenteric opening located 80 cm from the fixed loop, which generated an internal hernia of the mid-gut, compromising 250 cm of jejunum-ileum, from 70 cm from the angle of Treitz to 60 cm from the ileocecal valve. This produced strangulation of the loops with necrosis, multiple perforations and maceration. The loops did not recover their color after release.
3. Firm adhesion in a thin loop 90 cm from the ileocecal valve, partially obstructing the intestinal lumen and leaving notches in the intestinal wall.
4. Ischemic mesentery of the jejunum-ileum with a violaceous color and thrombi in the affected segment.
5. Remaining small intestine: proximal jejunum of 70 cm and distal ileum of 60 cm edema, with changes in violaceous color. Exploratory laparotomy, adherenciolysis, resection of 250 cm of small intestine (jejunum-ileum) and preparation of a terminal jejunostomy of the Hartmann type were performed. In addition, lavage of the abdominalcavity was performed.

Fig 1- *Intestinal ischemia.*

Exploratory laparotomy, adhesiolysis, 250 cm resection of small intestine (jejunum-ileum) and creation of a Hartmann-type terminal jejunostomy were performed. In addition, lavage of the abdominal cavity was performed.

On the 3rd day of POM, the patient presented exudate of intestinal fluid, so he was treated with a negative pressure system. However, on the 21-day postoperative period, he was reoperated due to the appearance of dehiscence in 60% of the aponeurosis and skin sutures, with contained evisceration and abundant bilious intestinal secretion discharge. In the left hypochondrium, a retracted intra-abdominal jejunostomy was evident with 100% dehiscence of the fixation sutures. The following intraoperative findings were evident: 1) Intestinal fluid bilious, fetid, free in the cavity approximately 300 cc. 2.) Block abdomen, involving the stomach, colon and liver, edematous intestinal loops with areas of polishing, firm and loose interloop adhesions, 3.) Jejunostomy mouth in the abdominal cavity 60 cm from the fixed loop, 4.)

Hartman pouch in the terminal ileum 60 cm from the ileocecal valve, for which the following was performed: Exploratory laparotomy + Adherenciolysis + 1 cm resection of the jejunum 60 cm from the fixed loop + 1 cm resection of the terminal ileum + end-to-end jejunal-ileal anastomosis in 2 planes separately placed + Cavity lavage + preparation of a Saratoga drain.

The patient during his immediate and mediate postoperative period presented multiple metabolic, hydroelectrolytic, neurological and hemodynamic complications, requiring the use of mechanical ventilation and vasoactive agents.

Complex wound management: During POI, the use of a negative pressure system was started for the management of complex wounds. It was used for 2 months and 7 days with the preparation of said system on multiple opportunities, showing high intestinal fluid expenditure at the beginning, which was later reduced until it was scarce. Once abundant granulation tissue was generated and there was no expenditure by the negative pressure system, management continued with dressings impregnated with Manuka honey in the proximal 1/3 with a paraffin dressing to promote granulation. Likewise, somatostatin was administered (3mcg/kg/day) for 17 days and 20% human albumin (1g/kg/day) for 6 days due to hypoalbuminemia and being in anasarca, which was complied with until the condition resolved.

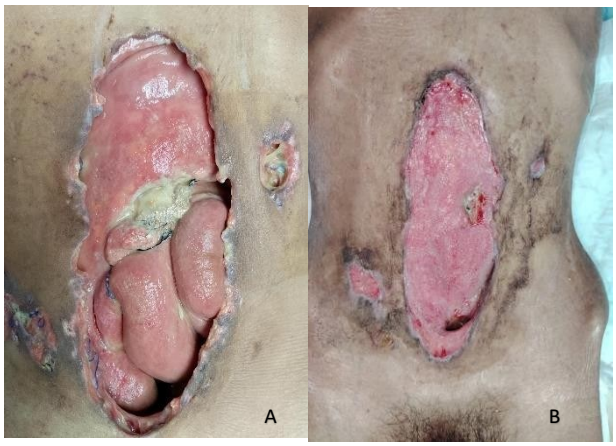

Fig. 2- *A) 2 weeks with negative pressure system treatment. B) 45 days with negative pressure system treatment.*

Patient who, due to being kept on an absolute diet for a long time, is associated with parenteral nutrition with Kcl: 2 meq/kg/day, calcium: 100 mg/kg/day, VIG: 4 mg/kg/min, magnesium: 30 mg/kg/day, NaCl: 2 meq/kg/day, amino acids and lipids. An attempt was made to start a trophic diet with a semi-elemental formula on several occasions, however, abundant bile and gastric expenditure was evident through NGT, so it was omitted. The percentage of intestinal resection was calculated, which was 82% anatomical, of which only 9.7% is functional, so the patient is kept under follow-up by the NCD service for indication of specific diets, polymeric formula and chicken concentrate. Parenteral nutrition is progressively reduced and chicken concentrate and polymeric formula are increased, and later, due to improvement and tolerance, the patient is moved to a soft diet. In the 2-month and 7-day POT, the patient shows hemodynamic and neurological instability, as well as paraclinical findings compatible with refeeding syndrome, which is associated as a diagnosis, and oral administration is omitted for 72 hours, which is considered resolved 27 days later. At discharge, the patient is without hydration or parenteral nutrition, receiving 6 ounces every 6 hours of polymeric formula, in addition to 3 main meals (cooked potato 101g - 3/4 cup or cooked ocumo 63g - ½ cup + 35g or 2 tablespoons of chicken) 2 snacks (non-citrus fruits, apple, pear, melon, watermelon).

Discussion

Short bowel syndrome (SBS) is a complex condition that results from the loss or dysfunction of a significant portion of the intestine, limiting the capacity to absorb nutrients. This frequently leads to the need for long-term parenteral nutrition (PN) to compensate for intestinal failure. Common complications of SBS include catheter-associated infections, liver disease, and impaired wound healing due to malnutrition and prolonged effects of PN. (3) (7) (8).

In the context of a clinical case of a pediatric patient with SBS, the use of negative pressure therapy (NPT) has been documented as an effective tool for managing complex wounds, particularly those with high exudate production. This therapy creates an environment conducive to healing by reducing exudate and promoting granulation tissue formation. In the documented case, TPN use was extended for more than two months, with weekly changes allowing for the formation of granulation tissue and a gradual reduction in intestinal output, facilitating the transition to conventional methods of healing once exudate decreased significantly. (1) (2)

Wound management in patients with SBS can be especially challenging due to the high incidence of metabolic and wound healing complications.

TPN has been shown to be effective in reducing healing time in wounds that might otherwise become complicated by recurrent infections or dehiscences. This treatment not only improves healing outcomes, but also contributes to reducing bacterial load and local inflammation in open and complex wounds. (3) (1) (2) (7).

Finally, the literature suggests that the management of patients with SIC should be interdisciplinary, integrating pediatric surgeons, gastroenterologists, and nutrition specialists. This is essential to maximize intestinal adaptation, reduce PN dependency, and prevent long-term infectious and metabolic complications. (1).

Conclusion

Multiple studies have demonstrated the great utility and benefits offered by negative pressure therapy in the management of complex surgical wounds. This is constantly being studied in order to promote patient recovery, reducing as much as possible the risks that it may present. However, we must take into account the importance of multidisciplinary management associated with this type of therapy to obtain a satisfactory clinical evolution of the pediatric patient.

Conflict of Interest

The authors declare no conflict of interest.

References

1. Figueroa-Gutiérrez L, Martínez-Cano J, Giraldo Ossa B, López-González LA, Echeverry-Rendón S, Rodríguez-Suárez E, et al. Negative pressure therapy in pediatrics. Rev Colomb Cir [Internet]. 2020;35(4):614–20. Available http://dx.doi.org/10.30944/20117582.483

2. Bueno-Lledó J, Martínez-Hoed J, Pous- Serrano S. Negative pressure therapy in abdominal wall surgery. Cir Esp [Internet]. 2022;100(8):464–71. Available at: http://dx.doi.org/10.1016/j.ciresp.2021. 12.006.

3. Anaya-Flórez MS, Barbosa-Cortés M de L, Barraza Tinajero A. Ultra-short bowel syndrome and metabolic bone disease in a patient on total parenteral nutrition. Rev Mex Pediatr [Internet]. 2023;90(1):22–6. Available at: http://dx.doi.org/10.35366/112595.

4. Kalaiselvan R, Slade DAJ, Soop M, Burnett H, Lees NP, Anderson ID, et al. Impact of negative pressure wound therapy on enteroatmospheric fistulation in the septic open abdomen. Colorectal Dis [Internet]. 2023;25(1):111–7. Available in: http://dx.doi.org/10.1111/codi.16318.

5. Pepe G, Chiarello MM, Bianchi V, Fico V, Altieri G, Tedesco S, et al. Entero-cutaneous and Entero atmospheric fistulas: Insights into management using negative pressure wound therapy. J Clin Med [Internet]. 2024;13(5):1279. Available at: http://dx.doi.org/10.3390/jcm13051279

6. Marte Mena VA, Cruz Minier R. Management of pediatric patients from 0 to 18 years of age at risk of developing refeeding syndrome in the Robert Reid Cabral children's hospital in the period 2020-2022. Pedro Henríquez Ureña National University; 2023.

7. Gaibor Barahona CI, Garzón Cuadro D anggeli V, Carranza Bajaña LM, Maldonado Macías JM, Llumitaxi Mosquera IA. Management of Short Bowel Syndrome in Pediatrics. Scientific Publication of the Academic Vice-Chancellor's Office of the Technical University of Babahoyo [Internet]. December 31, 2021 [cited October 16, 2024];5(4):84-93. Available at: https://revistas.utb.edu.ec/index.php/rpa/article/view/2609.

8. Ayala-Germán AG, Loredo-Mayer A, Zárate-Mondragón F, et al. Hospital management of severe malnutrition in pediatrics. Acta Pediatr Mex. 2022;43(3):193-201.