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Fistuloclysis as Nutritional Therapeutics in a Pregnant Patient: A Case Report

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Abstract

Introduction: Fistuloclysis is the infusion of enteral nutrition through the distal stoma of the enterocutaneous fistula , as an alternative route of nutritional support, and is often used while waiting for surgical time in fistulas that do not close spontaneously. The management of patients with fistulas requires an interdisciplinary approach and poses a challenge for the treating team.

Case presentation: Female patient, 22 years old, 14 weeks pregnant and postoperative exploratory laparotomy for acute abdomen. Suture dehiscence occurred, so reoperation was performed , leaving with discharge duodenostomy and surgical fistula. The patient was fed via parenteral nutrition and fistuloclysis for 3 months until surgical closure.

Conclusion: Intestinal trophism associated with fistuloclysis has numerous benefits. Since fistulolysis , an empirical improvement in intestinal adaptation has been observed in the context of postoperative transit reconstruction. For this reason, it is considered a valuable access route, regardless of the caloric intake administered.

Keywords: Fistuloclysis; Intestinal Trophism; Enteral Nutrition; Parenteral Nutrition; Intestinal Failure

Abbreviations: ECF: Enterocutaneous Fistula; TPN: Parenteral Nutrition; EN: Enteral Nutrition; FC: Fistuloclysis

Introduction

Enterocutaneous fistula (ECF) is defined as the abnormal path between the gastrointestinal tract and the skin. Although they can arise spontaneously in patients with malignant pathology, radiotherapy or inflammatory bowel disease, they commonly develop as a complication of digestive surgery [1,2]. When ECFs originate in the small intestine, they usually cause intestinal failure, defined as the reduction of intestinal function below the minimum necessary for the absorption of macronutrients and/or water and electrolytes, requiring intravenous supplementation to maintain health and/or growth [3]. Fistulas are classified as low output, when the fasting output is less than 200 ml/day; medium, when it is between 200 and 500 ml, and high output, those greater than 500 ml/day [3-5]. In the latter case, the loss of intestinal fluid is considerable as well as electrolytes, minerals and proteins, which contributes to complications such as dehydration, electrolytic imbalance and malnutrition [6]. The conventional nutritional approach focuses on digestive fasting to minimize the output of the ECF, and total parenteral nutrition (TPN) to maintain the nutritional status and hydro electrolytic balance of the patient [7].

Depending on the location of the ECF and the output volume, enteral nutrition (EN) has been proposed as a physiological means for feeding the patient and preserving the integrity of the intestinal mucosa. In this sense, Fistuloclysis (FC) is the infusion of enteral nutrition through the distal stoma of the ECF, as an alternative route of nutritional treatment, and is often used during the surgical waiting time in fistulas that do not close spontaneously [3,6,8]. Among the benefits of its use, intestinal trophism is mentioned, which is associated with improvement in the immune barrier function, and with it the decrease in the rate of intra-hospital infections; decreased output of the ECF; weight gain, even in cases where successful weaning from TPN is achieved; protection of liver function against prolonged TPN therapies; and finally, nutritional recovery during the surgical waiting time until digestive recanalization [9-12].

The treatment of patients with ECF requires an interdisciplinary approach and poses a challenge for the team. The available evidence on nutritional therapy is scarce, based on limited clinical studies. Recommendations focus on medical/surgical treatment, while nutritional therapy is addressed

superficially. In addition, rare scenarios such as the course of a pregnancy in this context generate a higher risk of malnutrition and perinatal complications [13]. Therefore, the objective of this case report was to describe the nutritional approach through the use of Fistuloclysis in a pregnant patient diagnosed with intestinal failure, in the context of a postoperative period for acute abdomen, who was hospitalized from January to May 2024, at the Hospital General de Agudos Dr Cosme Argerich.

Case presentation

A 22-year-old female patient with a 14-week pregnancy was admitted to the hospital from another institution following exploratory laparotomy for acute abdomen secondary to intestinal perforation, with resection of 25cm of jejunum near to the duodenum-jejunal angle, side-lateral anastomosis and cavity lavage, due to generalized peritonitis. Ninety six hours after surgery, she developed suture dehiscence, which led to repeat surgery, suture resection, discharge duodenostomy and surgical creation of a distal mucous fistula (with an estimated small intestine length of 1.5m, presence of ileocecal valve, continuous colon, rectum, and anus).

In the immediate postoperative period, parenteral nutrition was started, covering all of his requirements by this route during his hospitalization. These were 1500 kcal, with a composition of 175 g of carbohydrates, 68 g of amino acids and 50 g of lipids. At the same time, he was supplemented with vitamins and minerals.

On the fourth postoperative day, FC was started with a complete semi-elemental formula (partially hydrolyzed nutrients), to be administered by continuous infusion pump, at a slow volume, reaching a tolerance of 500 ml in 24 hours , which is equivalent to 650kcal, 90g of carbohydrates, 33g of protein and 18g of lipids. In this context, the patient had between 1 and 2 Bristol -type 4 stools daily. It should be noted that when a larger volume of formula was administered or the patient was switched to a polymeric formula (with unhydrolyzed nutrients), there was a drastic increase in the number of stools, with a Bristol -type 7 consistency; therefore, it was decided to maintain a maximum infusion of 500 ml in 24 hours with semi-elemental formula.

Regarding oral administration, clear liquids were given only on demand and for the patient's comfort. The average output of the duodenostomy was 500-600 ml in 24 hours. This output was not reinfused distally due to the lack of hospital resources to re-infuse the chyme. At the biochemical level, 7 weeks after starting TPN, there were increases in liver markers such as FAL and transaminases attributed to prolonged TPN (Table 1). Therefore, it was decided to limit lipid intake to 4 times per week.

Table 1: Fistuloclysis In Pregnant Patient.

Fecha	29/1/24	19/2/24	20/3/24	25/4/24	3/5/2024	10/5/2024
ALP(U/L)	110	157	338	792	534	278
GOT(UI/L)	33	38	29	55	45	9
GPT(UI/L)	14	45	51	148	71	36
Total bilirubin (mg/dL)		0,93	1,83	0,5		
Total Protein(g/dL)		6			7	6,4
Albumin (g/dL)		3,06			3,97	3,5

In the 21st week of pregnancy, the patient presented a spontaneous expulsion of the fetus, which culminated in the interruption of the pregnancy. The patient continued to be hospitalized with a recanalization plan while awaiting the surgical time, due to the history of suture dehiscence. Although there were episodes where the tube located in the mucous fistula moved and came out, the surgical team repositioned it, thus, continuous FC was maintained for 3 months, at which time the operation was performed. From the surgery, a remaining length of small intestine of 1.5 m, presence of ileocecal valve and intact colon were reported. In the immediate postoperative period of transit reconnection, the patient was kept on digestive rest for 72 hours with TPN, then tolerance to liquids was started, and the patient quickly progressed to adequate feeding postoperatively with good tolerance and weaning from TPN.

Regarding nutritional status, the patient had been malnourished prior to pregnancy, as she reported a significantly low habitual weight (39 kg) with no apparent cause, and a BMI of 15.2 kg/m2 at the start of pregnancy (severe malnutrition). The body weight prior to the termination of pregnancy was 44 kg. At discharge from hospital, a value of 42.9 kg was recorded. The patient was monitored on an outpatient basis with good tolerance to the diet, without presenting diarrhea or symptoms of abdominal discomfort, with constant weight gains.

Discussion

In the present case, FC was implemented as an alternative feeding route to TPN, which could facilitate the patient's hospital discharge, since the ECF was not going to close spontaneously. In this sense, surgical closure of the fistula was not going to be possible until the end of the pregnancy, which meant that a prolonged hospital stay was anticipated, since the patient did not have the resources to continue home TPN. In this sense, Valderrama et al. in 9 patients with ECF at the level of the proximal jejunum, started TPN and FC without re-infusion of chyme. When they reached 80% of their requirements with a semi-elemental formula , they were disconnected from TPN, managing to maintain the patients' nutritional status during the surgical waiting time [14]. In the present case, it was not possible to wean the patient

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from TPN. First, because she did not tolerate high amounts of EN: when more than 500 ml of formula were administered, there was a drastic increase in the number of stools. Regarding the type of formula, a semi-elemental formula was chosen , because there was no equipment available for chyme re-infusion. In situations where a polymeric formula was given, the patient had an increase in Bristol -type 7 stools. Remember that FC without chyme re-infusion implies the absence of pancreatic-biliary secretions that ensure proper digestion of nutrients. In this sense, several authors report a weaning from TPN when FC is administered with chyme re-infusion [15-17]. Unfortunately, the resources and technology to carry out this technique were not available. Likewise, because the patient was undergoing a high-risk pregnancy and the nutritional requirements at this stage are greater, it was not feasible to disconnect the parenteral route since there was no certainty about the degree of intestinal absorption, putting fetal development at risk.

Regarding TPN, the patient presented expected complications such as catheter-associated infections (CAI). In this regard, Valderrama et al. described in their study that all patients undergoing TPN had presented at least one episode of CAI [14]. Another complication was the elevation of ALP and transaminases. The increase in ALP began to increase 7 weeks after the start of TPN. Although the parenteral formula contained omega 9 and 3 lipids, it was decided to modify its administration, and limit the infusion of fats to 4 times a week. In this regard, Wu et al. compared a group of patients with FC only, and another with FC and chyme re-infusion; and observed that the latter group had presented significant improvement regarding ALP and total bilirubin [18]. In the present case, there was no possibility of chyme re-infusion due to lack of resources. It should be noted that the improvement in the laboratory was empirically associated with the lower weekly lipid intake. ml /day on average. Considering that it was a duodenostomy and that the patient had an oral route for comfort, these values were considered acceptable, replacing the lost output by intravenous hydration.

One of the challenges of FC was the placement and permanence of the feeding tube in the fistula, since the organism expelled the foreign body; therefore, every 24-48 hours the surgical team had to relocate the tube, a fact that generated abrupt interruptions of EN. Because the patient never presented discomfort or abdominal distension, the tube was always relocated and FC continued. In this sense, the benefit associated with FC was mainly intestinal trophism. Similar results were obtained by Villatoro de Pleitez et al., who reported two cases of FC, where its main benefit was trophism. Although they did not achieve the disengagement of TPN, they did describe successful results after intestinal reconnection surgery. In the present case, after fistula closure and intestinal recanalization, the patient had an uncomplicated postoperative period, being able to wean herself promptly from TPN and feeding exclusively orally. During outpatient follow-up, a variety of foods were incorporated, covering their nutritional and water requirements, with a weight gain of 1.5 kg one month after discharge, and presenting Bristol type 3-4 stools.

Conclusion

Intestinal trophism associated with FC presents numerous benefits, such as improvement in the intestinal barrier function, immune function, liver function, decreased output through the fistula and prevention of intestinal atrophy. As described in the present case, FC showed empirical improvement in intestinal adaptation in the context of postoperative transit reconstruction. For this reason, it is considered a valuable access route, regardless of the caloric intake administered.

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